JULY, 1955

Products finishing

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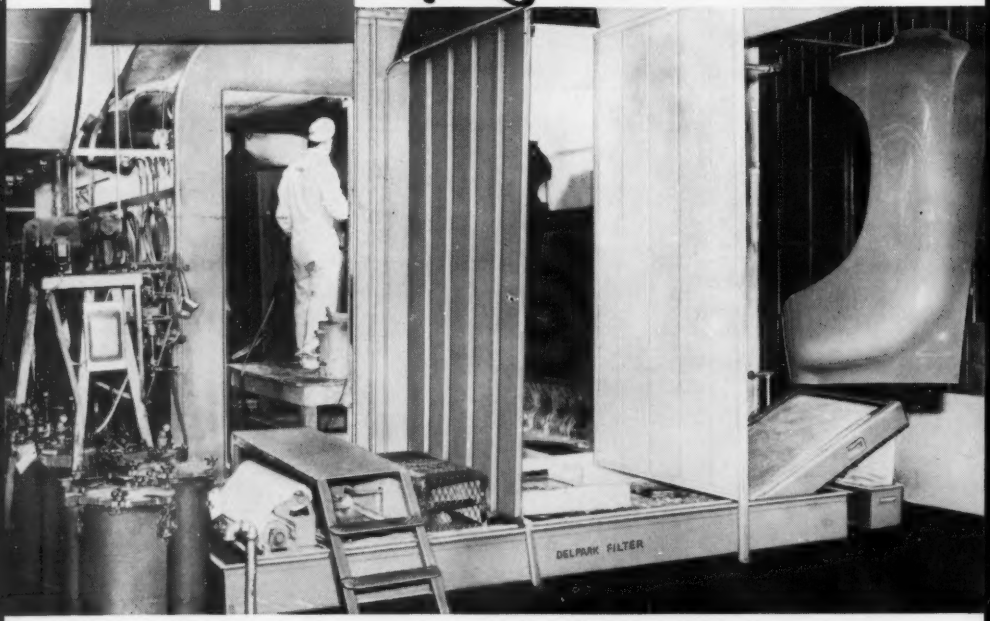
Finishes on *Metal* Products

Studebaker

SAVES TIME WITH

Delpark Spray Booth Filters



Automotive Synthetic Enamels, as a rule, are very difficult to handle. Equally difficult is the proper maintenance of spray booths where this type of enamel is used.

To reduce maintenance and cleaning time, the Studebaker Corporation has installed the DELPARK 36138 AFB Unit illustrated. This unit filters over spray from the wash water used in a spray booth where small sheet metal parts are painted.

With this installation, the Studebaker Corporation is effecting important savings in time and money.

If you have spray booths using wash water systems, DELPARK filtration can save you time and money on cleaning and maintenance. *Write today for further information.*

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BACKED BY MORE THAN 30 YEARS EXPERIENCE IN INDUSTRIAL FILTRATION

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JULY, 1955

Page No.	Name of Manufacturer	Page No.	Name of Manufacturer

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CO. ADDRESS_____

CITY_____ ZONE____ STATE_____

NAME_____ TITLE_____

Your Monthly Source For Finishing Ideas

Please send additional information on the products shown on the following pages of this issue. (List page numbers and names of manufacturer.)

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Page No.	Name of Manufacturer	Page No.	Name of Manufacturer

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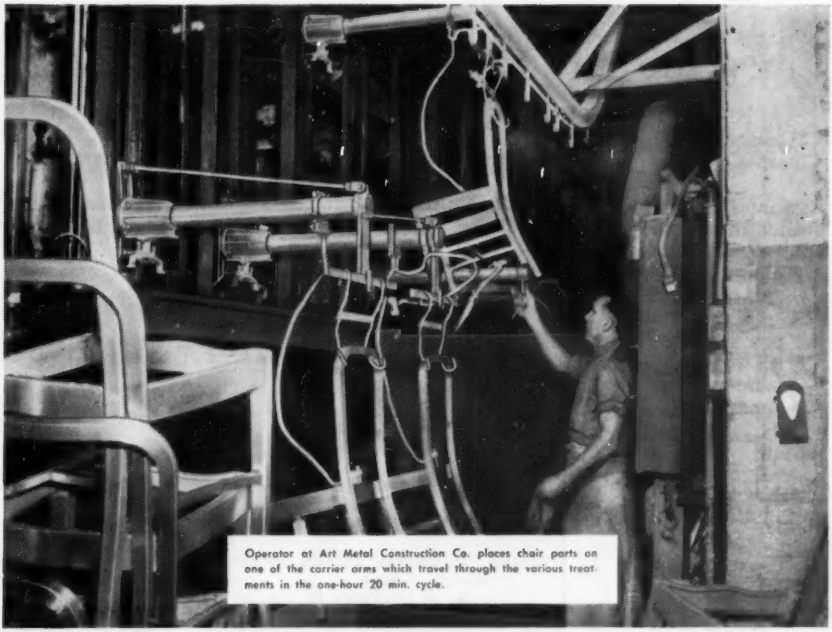

Operator at Art Metal Construction Co. places chair parts on one of the carrier arms which travel through the various treatments in the one-hour 20 min. cycle.

H-VW-M anodizing system combines quality control and production efficiency for metal chair manufacturer

When, eight years ago, Art Metal Construction Co., Jamestown, N. Y., began experiments in the manufacture of aluminum office chairs, they turned to H-VW-M for a completely automatic aluminum anodizing system that exactly fitted the requirements of the job it had to do, and the space available to house it.

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Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

GOLD is costly to plate

DON'T WASTE IT!

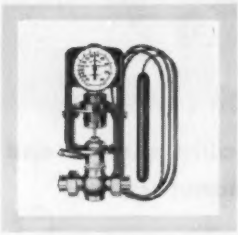
Even with traps installed to recover gold, you're *wasting* it . . .

IF you have to replate frequently

IF solution decomposes

IF there is excessive evaporation

Correct temperature regulation will help eliminate this loss of valuable gold, time and labor.



INSTALL POWERS AUTOMATIC TEMPERATURE CONTROL
for All Metal Finishing Processes

For plating tanks and other metal finishing processes. Powers Controls quickly pay back their cost by accurately holding solutions at a constant uniform temperature.

POWERS **4**

TECHNICAL DATA SHEET

GOLD

IF you plate — GOLD

Too high a temperature can result in:

1. Excessive build up of carbonates.
2. A tendency to spongy deposits.
3. Excessive evaporation.
4. Color variance.
5. Low cathode efficiency.

Too low a temperature can result in:

1. A low limiting current density.
2. Pale deposits.
3. Dark deposits.
4. Inclusion of foreign metals in the deposit (lower carat).

Write for Bulletin 330 (C-32S)

THE POWERS REGULATOR COMPANY

Skokie, Ill. • Offices in Chief Cities in U.S.A. and Canada • See Your Phone Book

VOLUME 19 NUMBER 10 JULY, 1955

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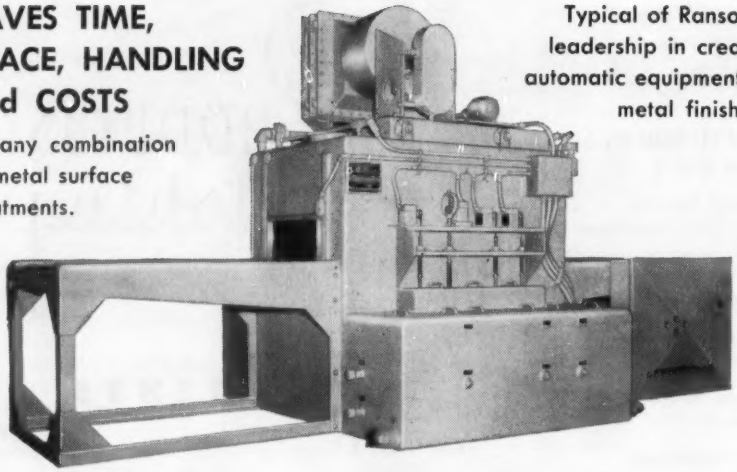
SAVES TIME, SPACE, HANDLING and COSTS

on any combination of metal surface treatments.

Typical of Ransohoff leadership in creating automatic equipment for metal finishing.



New "Walking Spray" Cabinet Type

RANSOMATIC

offers a big opportunity for economy if you now use still tanks

Just roll a batch of work into the cabinet of a Ransomatic, press a button, and the work will be treated with any pre-determined sequence of solutions and rinses—thoroughly, accurately and efficiently. Can be built for any size work or any number or combination of solutions. Also built in drum type for work that can withstand rolling. Send for complete details.

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of KALAMAZOO

FOR THE RIGHT FINISHING HEAD

Totally enclosed fan-cooled motor (3 and 5 HP, 1750 RPM and 7½ HP, 3450 RPM).

Sturdy steel column with 14" vertical movement.

Handwheel with ball thrust bearing for easy verticle column adjustment.

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the Perfect Combination

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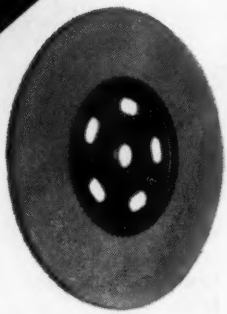

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These famous long-wearing buffs run cool under all buffing conditions. High count bias-cut cloth is assembled on ventilated steel centers. Each section is perfectly balanced and faced—requires no raking.

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- Are time and material costs eating up your profits?
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- Are you satisfied with the appearance of your finished product?

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HAS the ANSWERS

Paint department headaches will disappear with Spee-Flo Hot Spray Heaters. Production costs will drop and consistent, all-weather quality control will be established.

We'll be glad to show you facts and figures on how other manufacturers in your field are producing better products at lower cost. Spee-Flo Hot Spray Heaters pay for themselves in the first few weeks of operation . . . they are long lived and trouble free.

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SPEE-FLO HOT SPRAY HEATERS

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Builders of practical industrial and automotive hot-spray equipment

Please send me information on your line of hot-spray heaters best suited to our work. Type of products being finished_____
Application is conveyorized____ turntable____ mobile____ other____
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Type of material_____ Please have representative call____
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25% FASTER TUMBLING

Equipment and materials combined to increase direct-labor savings over other tumbling methods!

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Two Compartments

Grav-i-Flo's larger capacity plus improved cutting and finishing materials slash processing time—no need for transferring parts from cylinder between roughing and finishing. Get speed *and* smoother surface, higher lustre by asking for a Grav-i-Flo representative to visit your plant, or by sending us samples.

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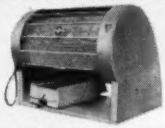
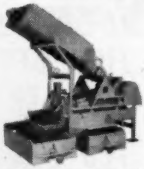


MODEL 66"—TWO COMPARTMENTS

MODEL 36"—TWO COMPARTMENTS

MODEL 32"—TWO COMPARTMENTS

MODEL 24"—TWO COMPARTMENTS



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Direct drive type with wheels mounted directly on motor spindle. Is most economical, however, limited to speeds of 1800 or 3600 R.P.M. (Other speeds to special order). Made in many types and sizes from ¼ H.P. to 7½ H.P. capacity.

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"HISEY" has available 63 standard types and sizes of Buffers and Polishers to meet your needs. They can of course also be modified to meet special conditions.

Regardless of size or price, "HISEY" Buffers and Polishers incorporate features for best performance and longest life, dictated by the know-how accumulated by constant improvement since 1896.

Ask for Catalog 72 PT

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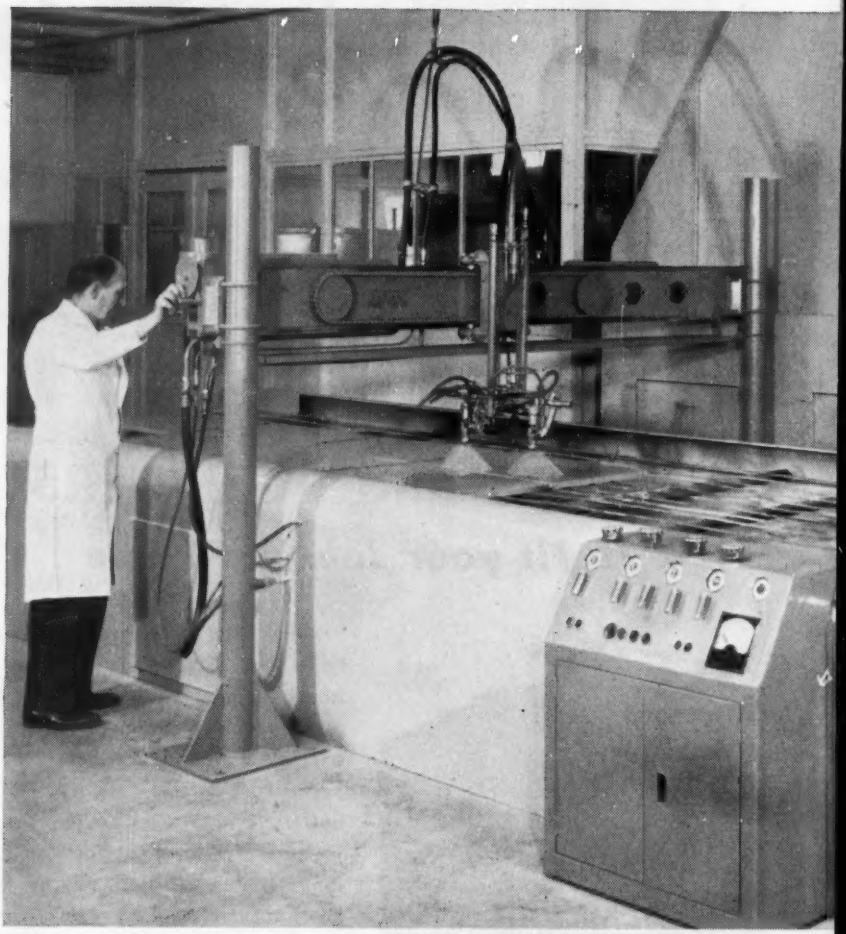
Division of The Cincinnati Electrical Tool Co.

Now! Spray varieties of objects



DeVilbiss Automatic Horizontal Transverse Machine. Whether you're working with flat parts, parts traveling on overhead conveyors, or parts that require both inner and outer coatings, you'll find DeVilbiss has a wide variety of automatic machines to serve you.

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in one automatic operation!

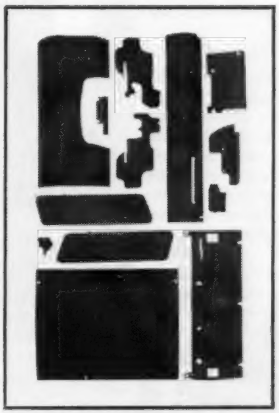
DeVilbiss Automatic Transverse Machines let you spray-paint parts of various sizes and shapes in gang runs for better finishes at great savings

YES – now you can paint short runs of a variety of parts, *automatically!*

The versatility of DeVilbiss Transverse Automatics lets you combine many different parts and components for precision, automatic painting in gang runs – the kind of painting that, in the past, seemed possible only by hand spraying! Not only is automatic spraying faster, but you enjoy *big cost reductions* as well!

In addition, DeVilbiss automatic spraying gives you finishes that are more uniform in film thickness, color and texture; its exact control practically eliminates rejects!

A call to your nearest DeVilbiss representative will bring a qualified technician to survey *your* production painting. He will let you know if your operations are adaptable to DeVilbiss automatic spray-painting equipment – and its big savings. Call today!



Objects of various sizes and shapes like these receive a uniform finish in a gang run on a DeVilbiss automatic spray machine.

THE DEVILBISS COMPANY
Toledo, Ohio

Santa Clara, Calif. • Barrie, Ontario
London, England

FOR BETTER SERVICE, BUY
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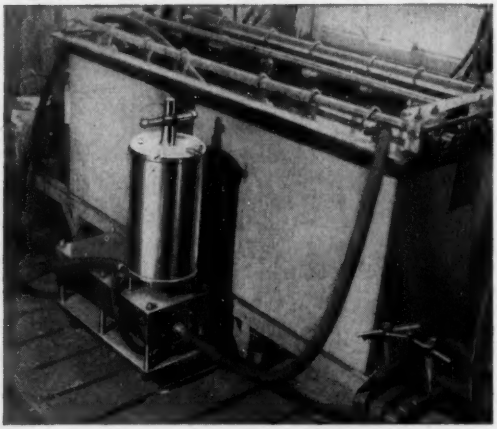
THE UNITED STATES, CANADA AND THE WORLD

Here's how to cut your losses

get better finished plated work — save time and labor



The *"Sealed-Disc"* Filter will remove all dirt, dust, and sludge from your plating solutions. You will no longer worry about pitting, spotting, poor adhesion, formation of nodules, etc.

More and more platers testify to the remarkable savings in operating time and labor that the *"Sealed-Disc"* Filter gives them. These cost-minded platers get better finished plated work and have found that their solutions last longer. *"Sealed-Disc"* Filters, designed to meet plating room requirements, are smaller, more compact and portable, than ordinary conventional filters.

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Supersheen

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ALBERT LEA, MINN.

MODEL DB 200

The Last Word in ADVANCED BARREL FINISHING

Model DB-200 shown with hoisting unit HU-1 and Hoist Pan Model HP-1.

THIS ADVANCED DESIGN BARREL OFFERS THE UTMOST IN EASE, ECONOMY AND PRECISION IN DEBURRING AND FINISHING OPERATIONS

- **Extremely Versatile.** Handles micro-finishing of small precision parts with same ease as fast cutting down of larger castings, forgings, etc.
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- **New — Cam-Operated Doors.** Cut opening and closing time in half. No other door can match it for ease, simplicity of operation.
- **Safety First.** Roll-a-way perforated hood permits positioning of barrel with hood down. No protruding parts.
- **All-Welded Steel Construction.**
- **Available with or without Neoprene Lining.**

ALMCO SUPERSHEEN • Albert Lea, Minn.

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FREE SAMPLE PROCESSING

Almco maintains complete sample processing and research facilities. Sample processing is done FREE! We invite your samples and inquiry.

FREE

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City _____ State _____

5 POINTS FOR FLAWLESS GALVANIZING

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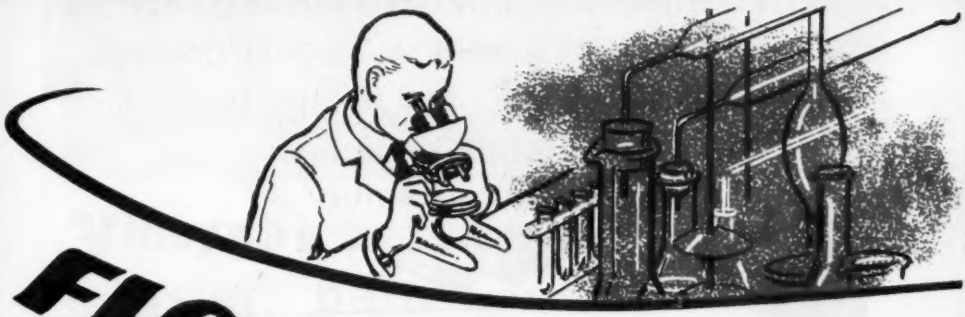

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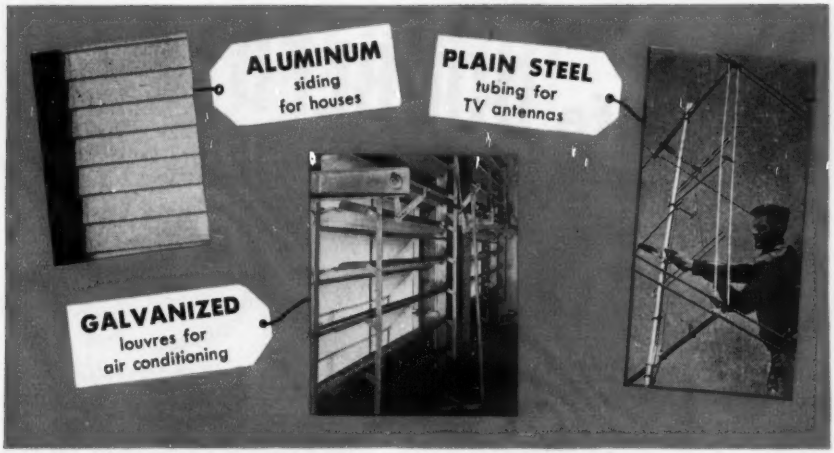

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pf editorial

Vol. 19, No. 10

JULY, 1955

How Good A Boss Are You?

The current emphasis on "automation" and mechanization of manufacturing processes tends to overlook the ever-present and important cog in the manufacturing machine—the supervisor. And no matter how automatic a paint finishing or electroplating process becomes, the difference between profit and loss can sometimes hinge on the interest of the men in the shop, and the degree of their enthusiasm in turning out a quality product as economically as possible. In short, how well they respond to the leadership of the supervisor.

So it behooves each supervisor to take stock of himself frequently to determine his effectiveness. Some questions he can ask himself are:

1. Can you plan your work ahead?
2. Do you like your subordinates?
3. Are your orders obeyed promptly and fully?
4. Do you know how to make people do what you want them to do?
5. Do you know when and how to deliver an effective reprimand?
6. Do you consider your brother supervisors to be high-grade men?
7. Are you satisfied with the rapidity with which you have been promoted?
8. Do you know when and how to delegate authority to others?
9. Are you a good teacher?
10. Can you defend a management policy?

These and many other points to be considered in connection with this question of "How Good a Boss Are You," will be covered in some detail in an article to appear in a forthcoming issue of PRODUCTS FINISHING. If you are a supervisor, or if you want to be one, you will find much food for thought and action in the article.

It may help you do a better job; it may help you prepare yourself for a better job!

Ezra A. Blount

—EDITOR

The 1955 Coldspot "Super-Mart" refrigerator is finished in white enamel with tinted liner and gold trim.

(Photo courtesy Seeger Refrigerator Co., Evansville, Indiana.)

Steam Spray Painting Refrigerator Cabinets

By EZRA A. BLOUNT
Editor

At Seeger Refrigerator Company, Evansville, Indiana, refrigerator cabinets are spray painted using superheated steam as the atomizing medium. Of particular interest in this efficient paint finishing installation are the methods of paint handling, air handling, and paint application.

PF FEATURE

A SPRAY FINISHING INSTALLATION capable of finishing 1200 Coldspot household refrigerators and upright freezers in 8 hours efficiently and economically must be designed with great care. Elements requiring careful consideration include product handling, air handling, paint handling, and paint application methods.

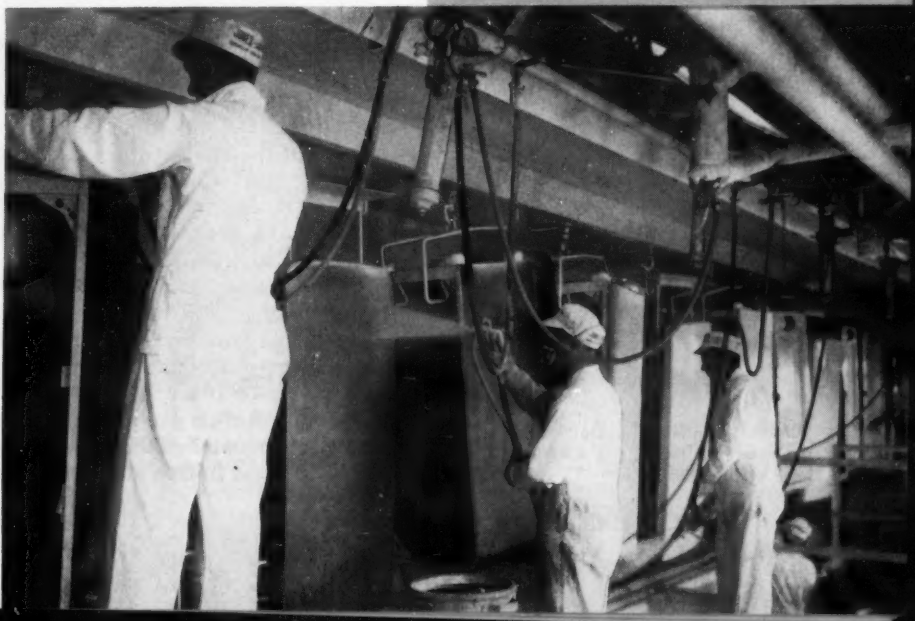


Fig. 1—Sprayers working on two levels apply primer coat with Binks steam spray guns to refrigerator cabinets, doors and door liners as they pass through the large DeVilbiss water wash spray booth. Primer is piped to a point near the spray guns and is circulated back to the mixing tank, thus maintaining uniform paint in the lines at all times.

Refrigerator cabinets, fabricated from 20 gauge steel and prepared for finishing, are hung on the finishing conveyor and transported through a 5-stage spray cleaning and phosphatizing machine. The process stages are as follows:

1. Alkali clean.
2. Hot water rinse.
3. Spray phosphatize with Bonderite 160.
4. Water rinse.
5. Chromic-phosphoric acid rinse and dry.

Deionized water is employed in the final rinses of this process.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

PRODUCTS FINISHING Magazine

"Chester is always making the boss red in the face, but this is the first time he's ever been so direct about it."

The cleaned, phosphatized steel refrigerator cabinets, still on the transport conveyor, are carried into the large water wash spray booth where the primer coat is sprayed on using steam spray guns (Figs. 1 and 2). Steam pressure is controlled between 40-60 p.s.i., and paint fluid pressure is regulated between 2-10 p.s.i. according to paint and application conditions. The use of steam makes possible a wider fan of paint spray on each spray gun so that the surface can be covered with fewer strokes. As a result there is less sprayer fatigue. Since the steam loses its velocity almost as soon as it passes through the spray gun nozzle, there is less paint spray bouncing back at each sprayer.

When superheated steam is released from a paint spray gun, there is immediate dissipation of velocity energy into the paint and the immediately surrounding atmosphere. This results in a minimum of turbulence on the surface of the objects being sprayed and also a minimum of paint loss caused by rebound from the sprayed surface.

Some other advantages of steam spraying include less paint loss through overspray, improved paint mileage, decreased difficulties with pinholing and popping in the paint film, increased film thickness and fewer coats (if and when desirable).

Cabinets, sprayed with primer, are conveyed through a circulating air convection oven for a 29-minute bake at 340 deg. F. The conveyor system is so installed that a sufficient period of time in free air is provided

to cool the baked cabinets before they enter the opposite side of the spray room in which is installed another spray booth similar to the primer spray booth. These booths are arranged back to back in the interest of efficient plant layout. Here, any loose particles are removed from cabinet surfaces with tack cloths, and the cabinets are then sprayed with white or colored synthetic enamel in the same manner as previously described. Steam pressure is held at 45 p.s.i. and paint fluid pressure at 2-10 p.s.i. for spraying enamel finish coats.

The cabinets then are transported through a finish bake oven where the synthetic enamel coat is baked for 42 minutes at 290 deg. F. The ovens are gas-fired, circulating air, convection ovens built and installed by Drying Systems, Incorporated.

Completed cabinets cool on the transport conveyor, are inspected, and then routed for touchup or to the final assembly line. The number of cabinets which do not pass final inspection is quite low due to the care taken in controlling the spray booth air and the spraying operation.

Air Handling System

Air enters the air makeup system and is first heated to 40 deg. F. The air then passes through an oil mist bath to remove dust or other foreign particles, after which it is processed through a water spray wash to remove oil or other material. The air is finally heated to 75 deg. F. before

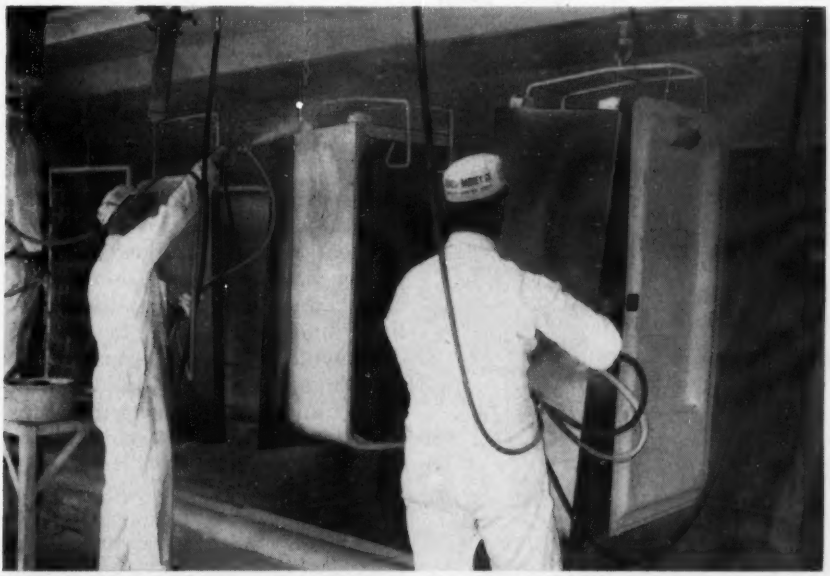


Fig. 2—Another view of the spray booth, showing a portion of the water curtain behind the refrigerator cabinets. Note versatile design of the hangers which transport cabinets, doors, or liners through the phosphatizing, painting, and baking processes.

being pumped into the pressurized tack and spray room (Figs. 1 and 2). The great volume of air handled requires a large, well-engineered air makeup processing system.

Cleaned and temperature-controlled air enters the spray room (Figs. 1 and 2) through a double inlet pipe located along the ceiling of the room, and passes through filters before actually entering the spray room proper. The volume of air pumped into the room is approximately 30,000 c.f.m. for each side, or a total of 60,000 c.f.m.

Air passes into the water wash spray booths and is exhausted through a series of water curtains that remove any overspray paint particles from the air. The volume of air exhausted by the spray booths is slightly less than the air pumped into the room, so that the spray room is under a slight pressure at all times. This keeps dust or other foreign particles from entering the enclosed spray room from the other factory areas and is a major factor in eliminating or reducing rejects due to surface imperfections.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

"I believe 'Windy' would work better on the other end of the hose."

Paint Handling Methods

The volume of paint consumed at the Seeger plant makes it profitable to deliver both primer and finish coat synthetic enamel in tank trucks. The paint is pumped directly into one of four 3,000-gallon storage tanks located in the lower level of the paint mixing room. Each of these tanks is fitted with a motor-driven agitator, and this agitator is run 1 hour before paint is pumped into the various mixing and delivery tanks, to secure uniformity of the paint.

As can be noted in Fig. 3, on the upper level of the paint mixing room are located a number of DeVilbiss 125-gallon mixing and delivery tanks where the paint is pumped from the large storage tanks. In the 125-gallon tanks, the primer or finish coat enamel is adjusted to the proper viscosity, mixed thoroughly, and then connected to the paint delivery lines so that it can be pumped directly to the spray guns shown performing the spray application in Figs. 1 and 2. The mixing tanks are used in pairs, so that one may be connected "on the line" to deliver paint, while the other one is being filled, and the paint mixed and adjusted to the proper viscosity. Paint circulates between the paint mixing tank and the spray room at all times to keep the consistency uniform and the temperature regulated between

75 and 80 deg. F. Heat exchangers keep the paint temperature uniform. **The use of a circulation system** for paint finishes ensures finish uniformity both as to viscosity, composition and color. All paint is mixed and circulated under laboratory control and each color or type of finish is circulated through one set of tanks and pipe lines. Hydrostatic gages show the number of gallons in the tanks at any time and assist the paint supervisor in securing the proper mixture of paint and thinner.

With identical finishes being delivered to each spray gun at the same pressure, spray application variables are reduced to a minimum. Rejects and refinishing are reduced, since the sprayed finish is more uniform.

Additional advantages include the elimination of the cost of moving paint and material tanks between paint mixing room and spray booths. There are no paint containers to clean and no loss in time and material from that source. Less floor space in the finishing installation is required since there are no paint tanks or material hoses to occupy spray booth or "clutter" the area.

Paint circulating lines are routed past a series of connections for spray gun material hoses and then returned to the paint mixing room. Thus, several sprayers applying one kind of paint can attach material hoses to the proper paint line. The same method is used to circulate the several finish coats, either white or col-

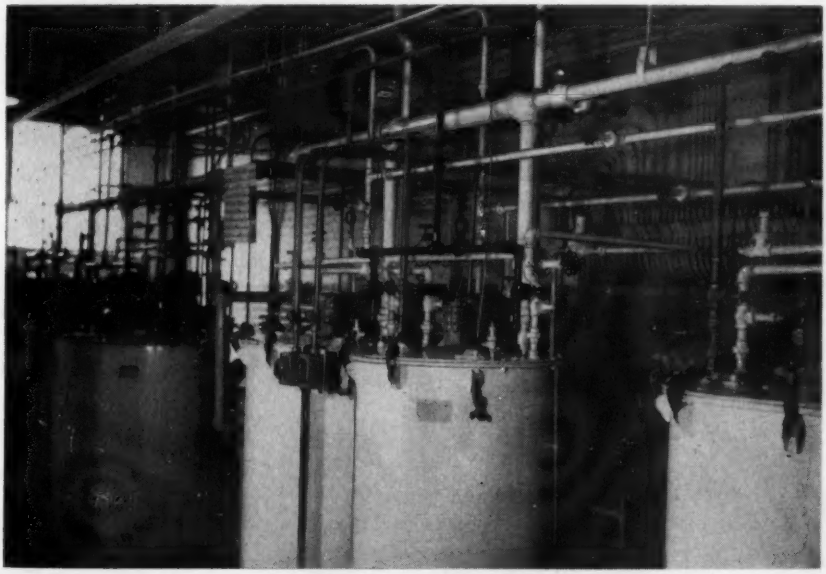


Fig. 3—A partial view of the spotlessly clean paint mixing and storage room. Tanks are used in duplicate, so that one is always supplying paint to the spray guns while the other is being filled, cleaned, and so on. All pipes here are color coded for easy identification.

ors. To change from one color to another, the operator need only wash out a short length of material hose and a spray gun.

Although the use of steam as the paint atomizing medium reduces the amount of paint overspray that falls into the water curtain of the water wash spray booth, such paint overspray as does accumulate is removed and salvaged. To the recirculating spray booth water is added ⅛ to ¼ oz./gal. Klarifiant (maintaining a pH of 9 to 10), to flocculate and float the paint particles. The water and the paint particles flow to the collecting pits (Fig. 4) where floating paint is skimmed off the surface of the water. The water then passes through two sets of screens, after which it is pumped back to the spray booths to begin another cycle. All paint sludge collected by skimming or on the screens is reclaimed by the paint manufacturer.

The job of finishing appliances rapidly, efficiently, and economically, utilizing a minimum of floor space is not an easy one. It is being accomplished at Seeger in the spray finishing installation described briefly here, where careful attention to important elements of the paint finishing process pays off in improved finish quality and reduced cost.

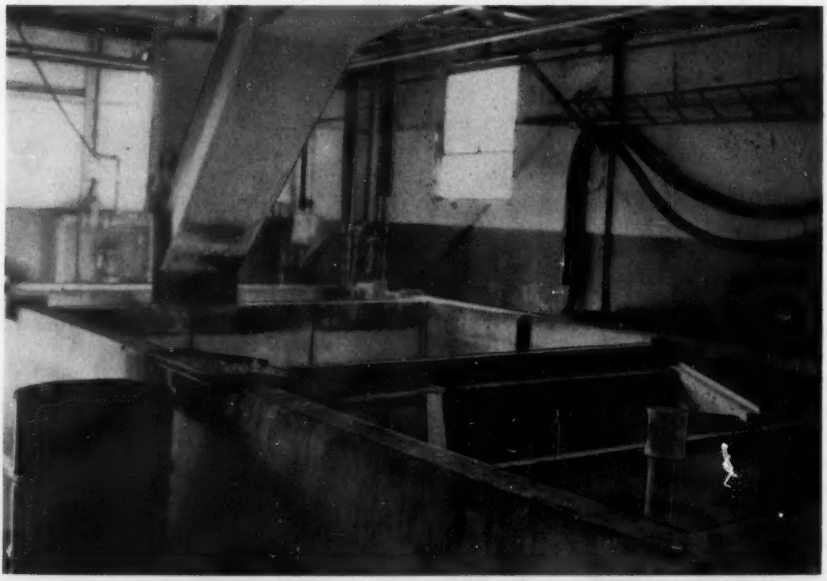
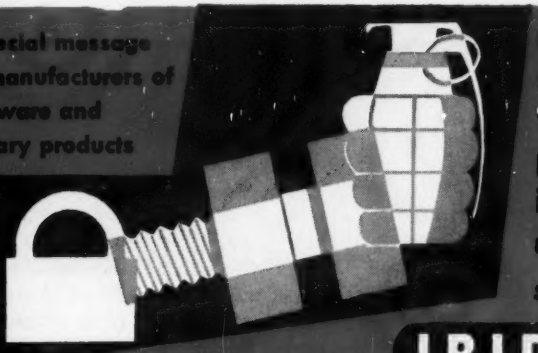


Fig. 4—View of one of the collecting pits into which the water from the water wash spray booths flow. Paint particles are skimmed off and screened out of the water, which is then recirculated back to the spray booth. The water is separated and directed to various pits according to the kind of paint it contains. Thus paint may be segregated for easier and more successful reprocessing by the paint supplier. (Photos by PRODUCTS FINISHING)

a special message for manufacturers of hardware and military products



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pH for the Electroplater

By J. B. MOHLER

pH measures the hydrogen ion concentration of a plating bath; in many baths this determines both the quality of the deposit and the efficiency of deposition.

The hydrogen ion determines the acidity or alkalinity of a bath and therefore determines the chemistry of the bath, which in turn affects chemical balance, decomposition, bath control and plating quality.

Control of the hydrogen ion concentration, or pH is important to a different degree in each bath, but it is important in all baths.

Control

Every plating bath is controlled. For some applications, such as thin chromium deposits for decorative purposes, control may be simple.

Table I

pH RANGES OF COMMON PLATING BATHS

Bath	*pH Range*
Brass-Cyanide	10.5-13.0
Cadmium-Cyanide	12.0-13.5
Copper-Cyanide	12.5-13.0
Copper-Pyrophosphate	8.2- 8.8
Iron-Acid	2.8-3.4, 4.0- 5.5
Lead-Acid	0.2- 2.0
Nickel-Acid	2.3-4.5, 4.5- 5.6
Silver-Cyanide	11.2-12.0, 12.0-13.5
Tin-Acid	0.2- 2.0
Tin-Alkaline	13.0-13.6
Zinc-Acid	3.5- 4.5
Zinc-Cyanide	13.4-13.8

A measure of adequate control is whether or not trouble can be avoided. Good control anticipates trouble rather than serving as a remedy after the trouble has occurred. Control is to keep you out of trouble, not to get you out of trouble.

The principal methods for plating bath control consist of chemical analyses, plating tests, gravity measurements and pH measurements. Other tests, such as surface tension, cathode efficiency measurements and various physical tests of the deposit are less commonly applied.

Of the common control methods, the methods of analytical chemistry are the most fundamental. By the use of such methods all major ingredients can be held within well defined chemical limits.

Plating tests that measure the plating range of the bath, such as the Hull Cell test, the slot test or the bent cathode test, are often necessary for the control of organic addition agents that cannot be determined by analytical methods.

Gravity measurements are used particularly for the chromic acid bath and the acid copper bath, because such measurements are sufficiently accurate and extremely simple to make.

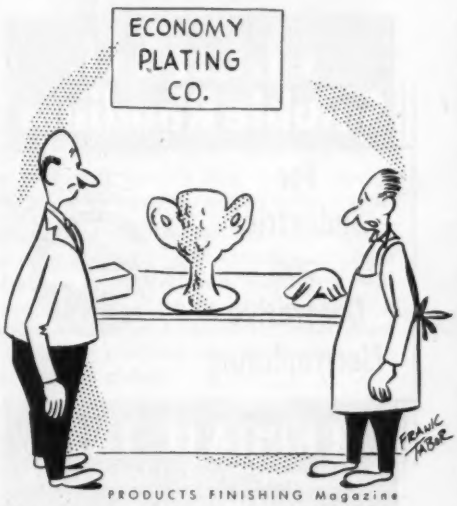
pH measurements are rapid, reliable and accurate. They may be applied directly to many baths and are often a fundamental control factor, such as in the nickel baths.

The term pH is merely a mathematical means of expressing the hydrogen ion concentration of a solution. For practical purposes it expresses the acidity or the alkalinity on a scale from 0 to 14. On this scale 0 is strongly acid, 7 is neutral and 14 is strongly basic. In rough terms a 5 per cent solution of a strong acid would be at one end of the scale and a 5 per cent solution of a strong base at the other end. Also a dilution of 10 times will change the pH by approximately one pH unit. Therefore a 0.5 per cent solution of a strong acid would have approximately a pH of 1 and a strong base of the same concentration a pH of 13.

Common pH ranges for plating baths are shown in Table I. These ranges do not cover all cases, but they are typical for the various baths. It will be noticed that all of the cyanide baths are of pH 10.5 or higher. The baths in a pH range of 5 to 9 are essentially neutral in that the chemical activity in this range is sufficiently weak that active metals like aluminum, magnesium and zinc are not readily attacked. Thus the copper pyrophosphate bath is used for plating on zinc and aluminum. A high sulfate nickel bath in the pH range of 5.3 to 5.8 is used for plating on zinc and on aluminum with an immersion plated zinc coating.

Plating baths commonly contain strong acids and strong bases. Also they contain acidic and alkaline salts and weak acids and alkalies. The chromic acid bath, containing little else than a high concentration of a strong acid, has a pH lower than zero. The acid copper bath containing up to 15 oz./gal. of H_2SO_4 is also in this range. Nickel baths contain boric acid, the presence of which prevents rapid changes in pH in a nickel bath during use. Such a weak acid or a weak base that inhibits pH fluctuations is known as a buffer.

There are a few more reference points that are of interest before we consider the details of pH control. The concentration of free cyanide commonly used in plating baths will result in a pH of about 10.5. The concentration of sodium carbonate normally added to a bath or that builds up in an alkaline bath due to bath decomposition, will result in a pH of about 11.0. This indicates that at a pH of about 10 that there would be no free caustic or carbonate in the



"Guess I used too high a current density."

bath and that cyanide would be combined. Such can be the case in an indium bath or a zinc bath where the metal forms complexes both with cyanide and caustic. At a pH of about 11.0 there will be no free hydroxide present.

pH Measurement

pH as measured by means of a pH meter is reproducible within very narrow limits. Because of this it is an excellent means of control in that once a reference point is established the condition can be reproduced.

For pH measurements up to a pH of 12 the glass electrode is used. For pH measurements above 12 the "E" glass electrode is used. The "E" glass electrode should not be used for pH readings below 10. In practical plating terms this merely means that the glass electrode may be used for all cases if desired, but that greater sensitivity can be obtained in the pH range above 12 by use of the "E" glass electrode. It also means one other thing. If a pH value is taken from the literature it is only the pH in terms of the method specified. If no method or no reference is specified it may be the true pH. On the other hand it may refer to a pH value from the early literature before the corrections were known.

For pH corrections of "E" glass and high temperature glass electrodes see Beckman Bulletins 100 and 228.

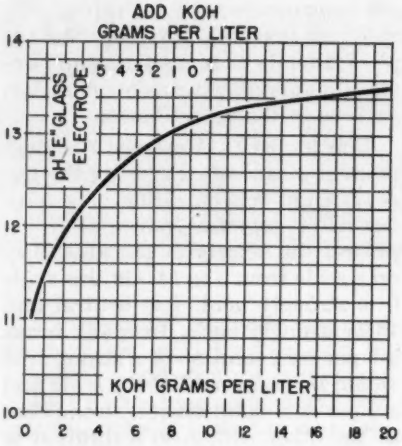


Fig. 1—Change in pH resulting from additions of KOH to a silver plating solution.

Change in pH

Figure 1 shows the change in pH as potassium hydroxide is added to a silver bath containing silver cyanide, potassium cyanide and potassium carbonate. With zero potassium hydroxide the pH is 11. An ad-

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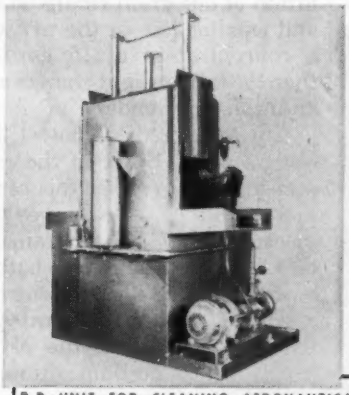

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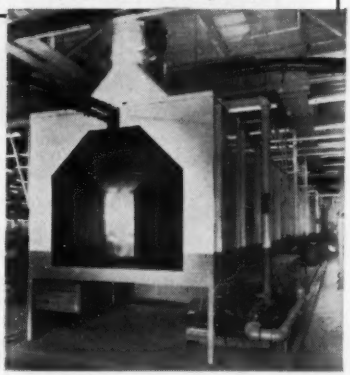

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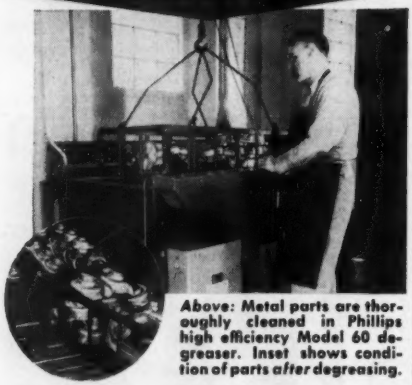

Above: Metal parts are thoroughly cleaned in Phillips high efficiency Model 60 degreaser. Inset shows condition of parts *after* degreasing.

HERE is another case illustrating the high cleaning efficiency of Phillips degreasers. Skil Corp., Chicago, uses a Phillips Model 60 electric batch-type machine to clean aluminum and iron castings, steel stampings, shafts and screw machine parts. These parts are thoroughly cleaned before painting and assembly. Among the types of soil removed are coolants, kerosene, drawing oils, and plain shop dirt.

Skil reports that the Phillips unit cleans their parts 3 to 4 times faster than their former method. Production is speeded up and better quality control is assured.

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In Canada: Mfd. by Williams Tool Corp., Brantford, Ont.

". . . brass bath is a case where pH measurements are of value."

dition of one gram per liter results in a pH of 11.7. Each successive addition of one gram results in smaller and smaller rise in the pH, until at a concentration of 15 gm./1.KOH there is only a slight change as small additions are made.

If it is desired to control the concentration of KOH in the range of 4 to 8 grams per liter this can easily and readily be done by means of pH measurements. The pH range would be 12.6 to 13.2. The fresh bath would be made up with a concentration of 9 gm./1.KOH. With working of the bath and with time the pH would drop due to decomposition of hydroxide to form carbonate. At the top of the graph the addition of KOH needed to return the pH to the high limit for any pH reading in the control range is shown. Control is reduced to two simple steps: One—read pH, two—add KOH.

pH in Brass Plating

The control of a brass bath is more complicated than most of the common plating baths due to the fact that the co-deposition of copper and zinc must be controlled. The composition of the deposit is affected by the copper-zinc ratio, temperature, current density and pH. The pH range is usually from 11 to 13.

The brass bath is a case where pH control is not normally practiced, but where pH measurements are of value. In plating for color, plating range tests are often used. By the use of such tests and by additions to a test bath the type and quantities

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of chemicals are determined to produce the desired color or to broaden the plating range. Additions of ammonia will often produce a more uniform color. Additions of ammonia and additions of sodium hydroxide will favor the deposition of zinc.

Ammonia will not be retained in the bath as long at high pH as at low pH value.

If it is desired to lower the pH, sodium bicarbonate may be added (with proper precautions).

Due to the necessity to obtain color, a wide plating range, and a satisfactory plating rate, the variables of the brass bath are adjusted according to necessity rather than to fixed limits. Yet control dare not be loose or it will be lost completely. A distinct aid to avoid such loss of control is the use of pH measurements. If the pH is high it is better to add zinc metal rather than sodium hydroxide to increase the zinc plating rate. If the zinc is also high in the bath, free cyanide may be added to decrease the copper plating rate. The color and composition of the deposit is affected by many variables. The control method consists of holding all of these variables within broad limits and adding the chemical that is nearest the low limit that will produce the desired result. The regular measurement of pH will readily tell when sodium hydroxide may be used as the control variable.

pH in Cadmium Plating

The concentration of sodium hydroxide in a cadmium cyanide bath

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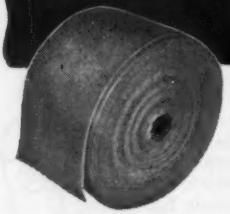

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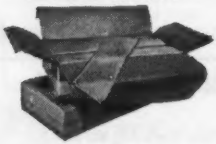

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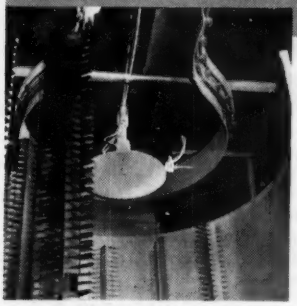

*Fluorescent Fixtures of California, in their modern plant in South San Francisco, uses the Ransburg No. 2 Process Reciprocating Disc Atomizer to paint their popular line of ALL-BRITE lighting fixtures. The quotes above are from Works Manager, R. H. Shaffer.

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is not critical. The main function of the hydroxide is to maintain high conductivity. However the hydroxide should be controlled. Hydroxide is formed by the addition of cadmium oxide to the bath when it is necessary to increase the metal content. An excess of hydroxide will cause a narrowing of the plating range in bright baths.

The sodium hydroxide content can be determined by titration to a pH of 11.2.

pH of Cyanide Copper Bath

There are a number of copper cyanide baths that may be classed in three categories. These are the low efficiency flash plating baths, the Rochelle baths and the high efficiency baths.

Sodium hydroxide aids bath conductivity and is usually controlled by direct pH in the range of 12.2 to 12.8 for the flash plating and Rochelle baths.

Hydroxide is added to the high efficiency baths in greater amounts because high conductivity is desired. In this case the hydroxide may be determined by titration to a pH of 11.2.

Iron Plating

Iron is deposited from a number of different chloride and sulfate acid baths. Most of these baths are op-

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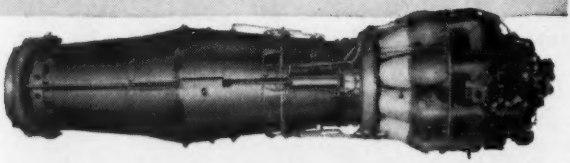

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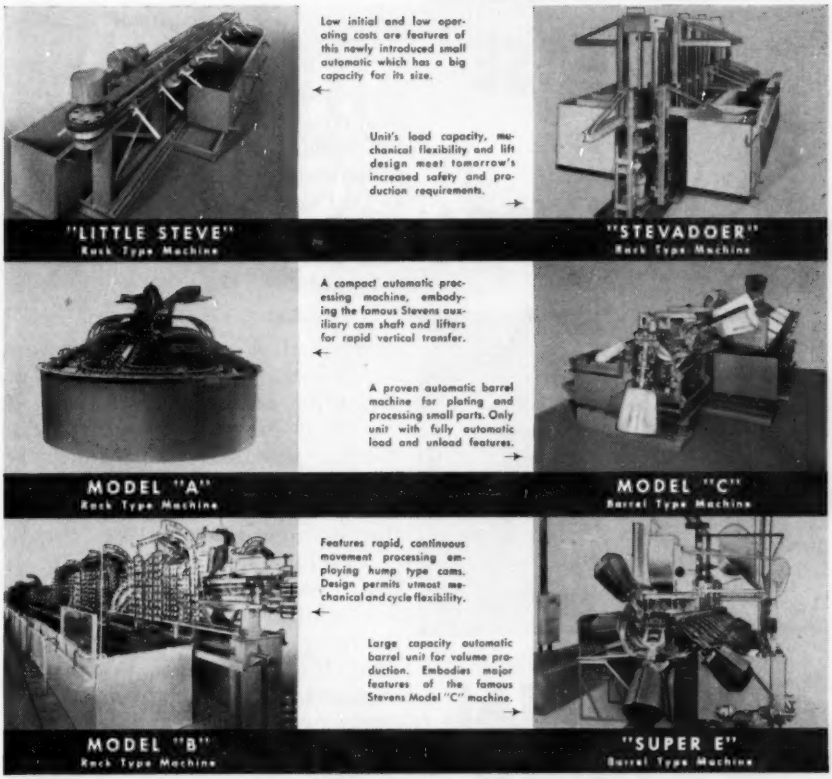
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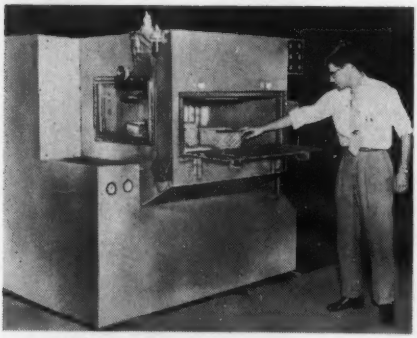

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erated with control of a pH range. The characteristics of the baths are different in the high and low range so that a pH control range is selected to best suit the use of the bath. In either case the pH can be accurately controlled by direct measurement with the glass electrode.

Nickel Bath pH Control

pH control is a "must" in the nickel baths. The characteristics of deposition are markedly affected if the pH is allowed to rise above the control range, and the pH normally rises slowly. The rate of rise depends on how hard the bath is worked, but the change takes place slowly enough that control is simple. Direct measurement of pH followed by an acid addition to the bath will readily bring the bath to the low pH limit. If a control chart is available, measurement and bath adjustment can be made in a few minutes.

The sensitivity of the pH measurement is important in control of nickel baths where the spread of the pH range is at times only 0.5 pH unit. When the range is this narrow measurement and control must be accurate. If the pH reading has a sensitivity of 0.1 pH unit it can be used, but about 40 per cent of the control range will have to be allowed for sensitivity alone. With other small errors that are bound to creep in, frequent additions would be necessary to maintain proper control. For control of this magnitude a sensitivity for the pH measurement of 0.02 pH unit is more practical. Such sensitivity is readily available in

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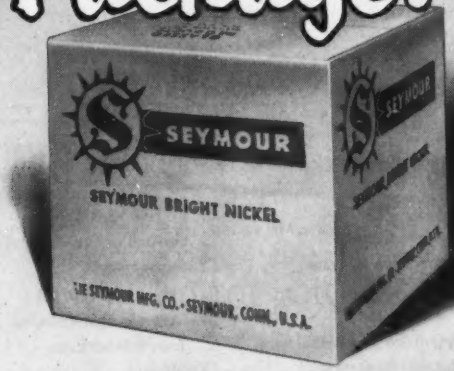

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commercial pH meters of the potentiometer circuit type. The instruments with a voltmeter circuit are less sensitive, but more practical for plant work, where a pH meter is required and where the lower sensitivity is not a serious control factor.

pH measurement is also very useful for purification of nickel baths by chemical precipitation of contaminating metals. Iron may be removed from a bath by oxidation followed by raising the pH above 4.0 with nickel carbonate. If the bath is not oxidized the iron may be precipitated at a pH of 5.5. It is important to measure the pH during the addition of nickel carbonate to avoid an excess of nickel carbonate that would be insoluble at high pH and then filtered off and lost during the following filtering step. Aluminum hydroxide can be precipitated at a pH of 4.0 and zinc hydroxide at a pH of 5.5.

Silver Plating Control

Many of the silver cyanide baths are operated without pH control. Other baths are controlled in a definite pH range and in still others the potassium hydroxide concentration is controlled by titration to a pH of 11.2.

There are a number of advantages to control of the hydroxide concentration in many baths. Such control aids in control of the plating range, aids

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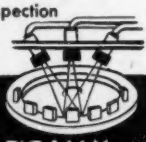

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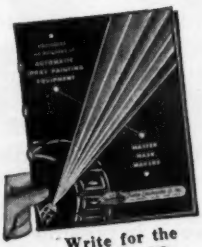

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anode solubility and decreases the decomposition of cyanide. In addition to these advantages pH measurements are used to make pH a control factor rather than an unknown variable and thus simplify bath control.

Alkaline Tin Control

Control of the hydroxide content in an alkaline tin bath is vital to maintain anode control and to maintain high cathode efficiency.

The hydroxide content may be determined by titration to a pH of 11.2 with a glass electrode.

If it is desired to keep a record of the carbonate content of the bath and if sodium acetate is not present the total alkali in the bath may be determined by titration to a pH of 4.2. The carbonate can then be calculated by subtraction of the amount of acid required to titrate to pH 11.2 plus the acid required to precipitate the tin. The acid required to precipitate the tin can be calculated from the analysis for the tin content.

Acid and Cyanide Zinc

The free acid in a zinc bath is controlled by direct pH. The bath is sensitive to excess acid which tends to re-dissolve the zinc. However, it is not sensitive within the pH range, and pH control is mostly a case of maintaining the pH range as a controlled variable.

Control of the sodium hydroxide concentration of a zinc cyanide bath is necessary to assure quality deposits at high cathode efficiencies. The hydroxide content is easily determined by titration to a pH of 11.2.

A complete presentation of pH measurements as applied to plating bath control would require a book on the subject. Such control methods are widely used and much has been written on control of specific bath formulations. Even so there are control possibilities that have not yet been applied. Fortunately the possibilities of pH control to a specific bath are easily determined. If the composition of the bath is known, as in the case of a freshly made bath, then the analysis of a pH curve will reveal the possibilities for control by direct pH or by titration. It will also reveal whether it is possible to determine one or more bath constituents.

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Results? The recommended HONITE procedure eliminated the polishing operation completely, and 60% of the rough grinding hand operation. Finishing time was cut 1½ hours . . . and finishes were improved to a superfine finish.

CHERRY-BURRELL METHODS ENGINEER, Ralph Wenger, holds a 40 lb. stainless steel milk filler tank. HONITE Barrel Finishing Method produced its superfine finish.

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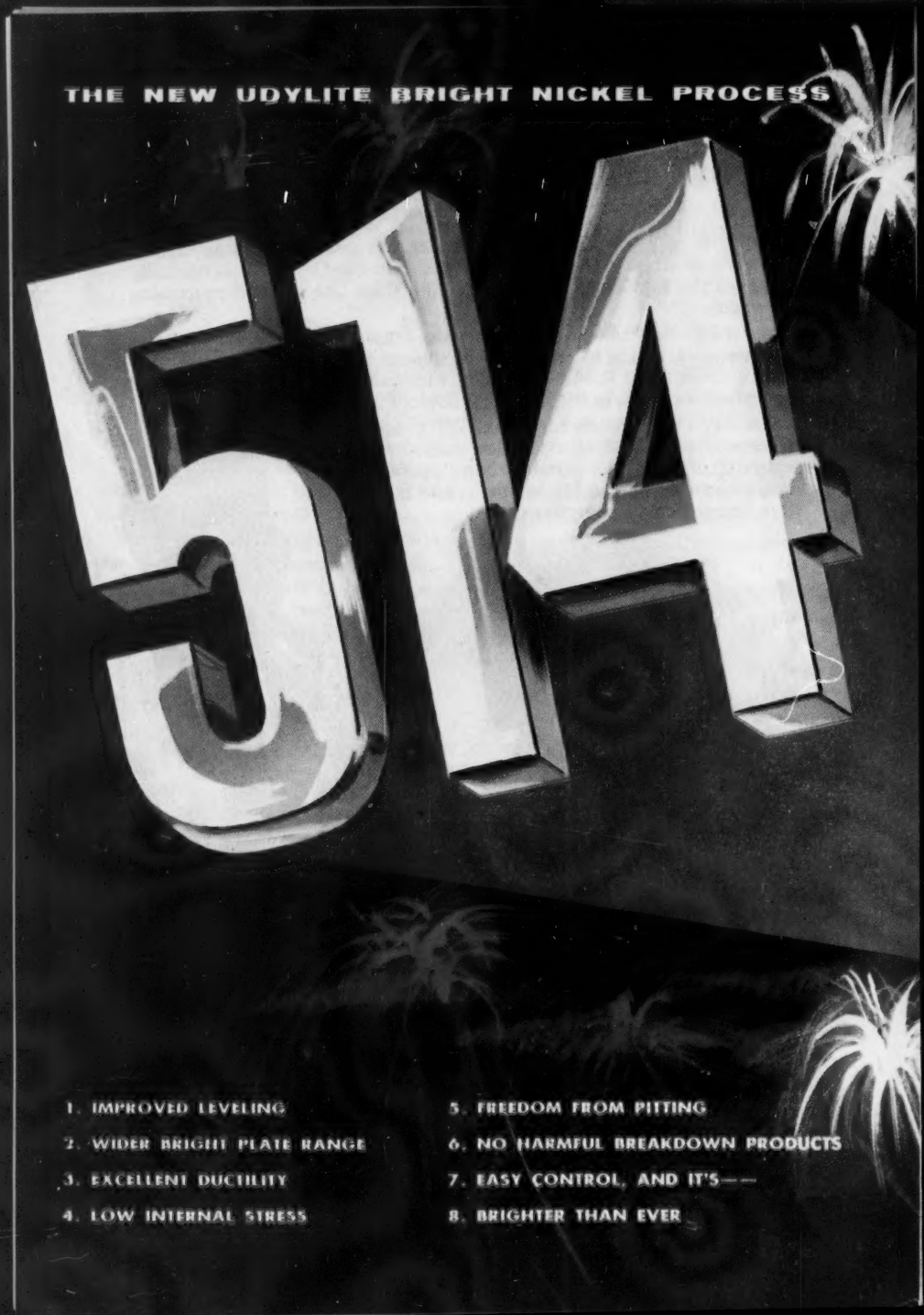
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Development of Automotive Touch-Up Paint

By Robert R. Elliott
Vice President
Tempo Products Co.
Cleveland, Ohio

SINCE WORLD WAR II there has been a rapid growth of Aerosol type packages in many fields ranging from the popular insecticides, room deoderants, and shaving creams to the many products in the industrial field. The aerosol method of dispensing fits right into the American way of life.

But sometimes the American Public balks at new methods. However, then another American method—education—is employed. This has been our experience at Tempo Products Co. since we started to market Tempo Instant Spray Auto Touch-Up Paint for automotive use.

In our planning and research of a market most needed in aerosols, the automotive paint touch-up market was selected. The first standard set was quality—not only quality of the aerosol package, but the paint itself. The paint had to be a perfect specification match and blend in with the existing car finish. The method of dispensing—the valve on the aerosol dispenser had to be perfect. The valve must not clog. Shelf-life of the paint had to be adequate. All these requirements were demanded of the "loader," and these were guaranteed.

In merchandising Tempo Instant Spray, we paint the protective cover cap the same color as the paint inside the can. We gave considerable thought to the design of the label, and directions for use printed on the can. In addition we furnish a descriptive folder entitled "A Masterpiece—In Minutes" plus an important educational bulletin of instructions, "Touch-Up Guide," and "Answers to Your Questions" about self-spraying aerosol paint plus tips on getting the most out of push-button painting.

Automotive dealers that have stocked Tempo Instant Spray are finding a number of uses for the product:

1. New car conditioning.
2. Used car re-conditioning.
3. Sales over the parts and service counter.
4. Use by the Service Department in handling costly small and annoying customer complaints.
5. New car prospecting with Tempo Instant Spray as a give-away item.

Aerosol paint does not cut into a dealer's refinish business in his paint department, but instead serves as a time and cost saver.

Uses for aerosol paints include repairing scratches on automobiles and household items. These paints must be perfect color matches to blend into the existing finish. Photograph courtesy Sprayon Products, Incorporated, Cleveland, Ohio.

We are now marketing Tempo Instant Spray in exact color specification touch-up in the automotive field for Chevrolet, Ford, Plymouth, Buick and Oldsmobile with other makes under consideration. From a loader's and supplier's standpoint, the number of colors presents a tremendous inventory and obsolescence problem. However, we need them all since "you can't sell from an empty wagon."

Besides the automotive market, Tempo Instant Spray made its introduction in the outboard motor and marine field during the past year with the complete endorsement and factory approval of the two leading manufacturers of outboard motors, Johnson and Evinrude. Here again was the need for quality, exactness in color match, perfect atomization of the valve — a self-spraying paint package that really works.

Specification touch-up paint is a highly specialized line, but there are many other products in the auto accessory field that lend themselves to an aerosol package. They are of great interest to the motoring public and can be sold through the many and varied automotive channels.

Adapted for publication in PRODUCTS FINISHING from a paper presented before an annual meeting of the Chemical Specialties Manufacturers' Association.

★ ★ ★

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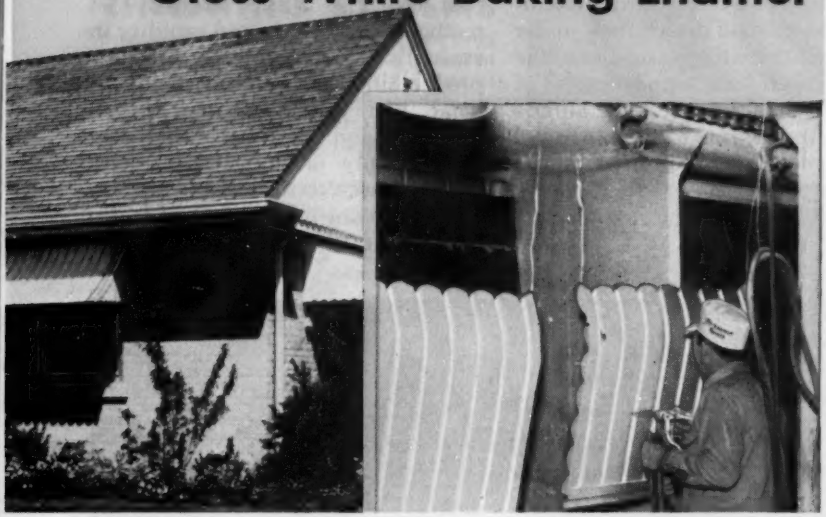
Aluminum Awnings

Finished with Pittsburgh's Gloss White Baking Enamel



chemical fumes in some areas of the Gulf Coast couldn't stain or deface their gleaming whiteness.

Besides good color-holding throughout its life, this finish is remarkably tough and flexible. It resists marring during boxing, shipment and installation.

Another equally important reason for Childers' continuous use of Pittsburgh's Gloss White Baking Enamel is its simple and easy application by hot spraying. This permits speedier production with practically no rejects, appreciably reducing manufacturing costs.

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Pittsburgh Plate Glass Company
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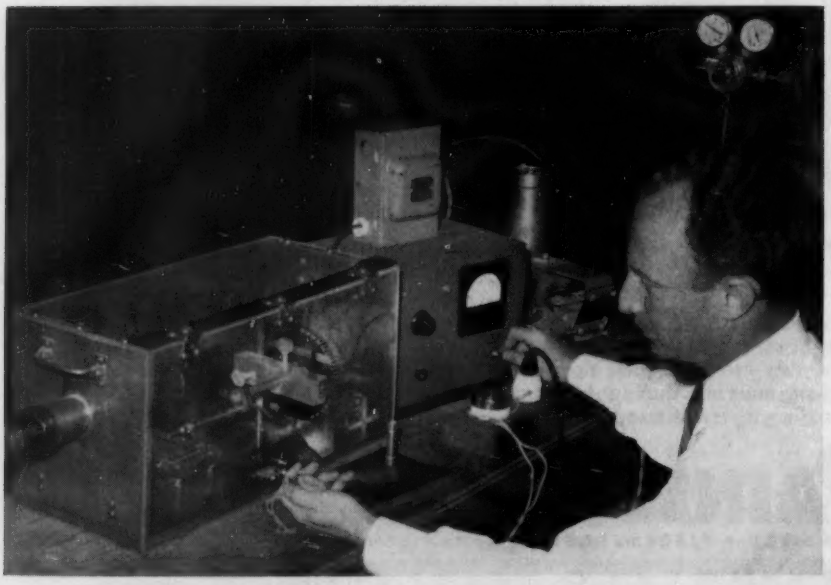
Testing the Abrasion Resistance of Organic Coatings by the Abrasive Jet Method

A SIMPLE, rapid method for measuring the abrasion resistance of organic coatings on metals has been developed by A. G. Roberts, W. A. Crouse, and R. S. Pizer of the National Bureau of Standards. Essentially, the method determines, under controlled operating conditions, the time required for a high-speed jet of fine abrasive particles to abrade through the coating to the substrate. Development was sponsored by the Navy Bureau of Aeronautics in connection with a program for production of more durable, scuff-resistant finishes for naval aircraft. Because the instrument readily simulates a variety of service conditions, the N.B.S. procedure can be used to determine abrasion resistance on all types of protective coatings, regardless of gloss, color, thickness, or surface area.

Abrasion resistance is often one of the most important factors in the service performance of protective coatings. The N.B.S. abrasive jet method permits ease and rapidity in evaluating materials and good reproducibility because it does not depend upon abrading an area of definite size and uses a continuously fresh supply of abrasive particles under closely controlled conditions. The end point in this method is the first show of bare metal and is read-



Coated specimen being tested for abrasion resistance by the Abrasive Jet Method.

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Chicago Office: 4554 N. Broadway
Sales offices in all principal cities

Lyle Sign Co., Minneapolis, increases metal sign production 25% with DESPATCH conveyorized Finishing System.

Bunting Glider Co., Ardmore, Pa., metal furniture makers, gets 4 times the production, no operating cost increases with this DESPATCH Conveyorized Washer and Dryoff Oven.

Atlas Mfg. Co., St. Paul, cuts labor costs 25% on furnace casings and boiler jackets with this DESPATCH FINISHING SYSTEM.

Ceco Steel Products Corp., Chicago, washes, paints, finish-bakes airplane landing mats on a stepped-up schedule with this DESPATCH Finishing System.

PIONEERS IN ENGINEERING HEAT APPLICATIONS FOR INDUSTRY

ily detected when coating and substrate differ in color, as is usually the case; otherwise, inspection with a hand lens is necessary.

In the abrasive jet method, carbon dioxide gas under controlled pressure propels an abrasive powder from a vibrating storage chamber through a nozzle to impinge at high speed upon the test specimen. A solenoid valve operated with a manual switch turns the flow of the abrasive powder on or off. The mounting arrangement for the test specimen and nozzle assembly permits rotational, back and forth, or up and down adjustment, while the angle between the nozzle tip and surface to be abraded is adjusted by a graduated rotating disk attached to the nozzle shaft. A specially calibrated taper gage permits rapid and accurate adjustment of the nozzle-to-specimen distance at abrading angles from 20 to 90 degrees. The specimen holder and the nozzle assembly with its adjusting parts are housed in a rectangular brass chamber with a transparent plastic front door and top.

The spent abrasive particles and coating debris are removed through a vacuum exhaust outlet at one end of the test chamber. Rapid monitoring of the abrasive flow rate is accomplished by a weighing tube that has a rubber diaphragm with a hole to accommodate the nozzle tip at one end and a diaphragm of ordinary filter paper at the other end to permit escape of gas while trapping the abrasive particles.

Although operating conditions can be varied to accommodate extreme differences in materials, it is usually desirable to use a nozzle-coating distance of 0.04 inch, a gas pressure of 40 pounds per square inch, a flow rate of approximately 0.15 g. per second, and abrading angles of 90 degrees or 45 degrees. The 90 degree angle simulates the leading-edge type of erosion encountered by aircraft in flight, while the 45 degree angle simulates scuffing wear which aircraft receive during maintenance operations when they are walked on, struck, or scraped by hose nozzles.

The abrasion time for a given material depends on the test conditions; it increases almost linearly with increasing nozzle-to-coating distance, decreases with increasing pressure, and decreases with decreasing angle of abrasion from 90 down to about 30 degrees. At smaller abrading angles, the abrasion time rises again.

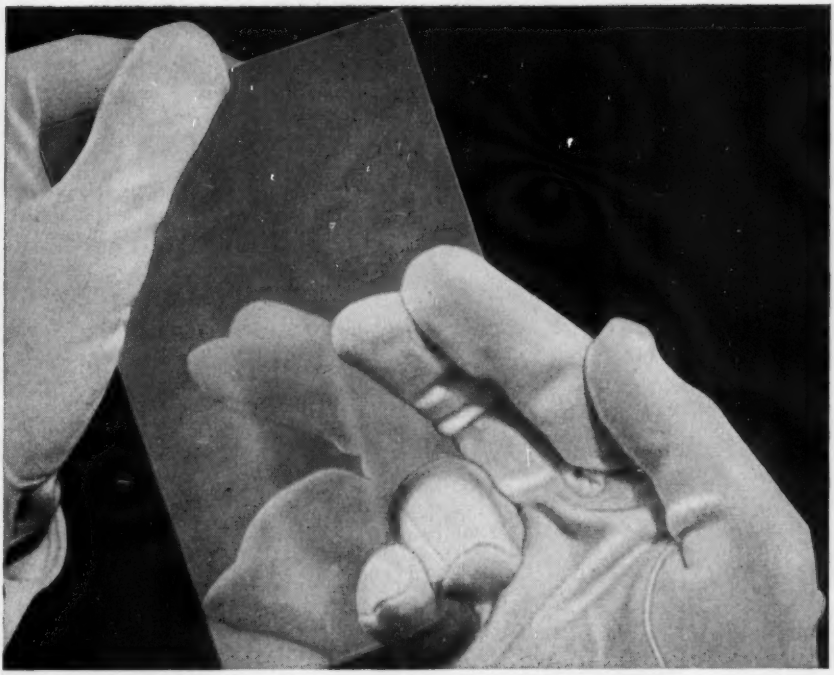
In the studies at the National Bureau of Standards, the abrasive jet method has been found to distinguish significantly between materials difficult to differentiate by qualitative means. Although the degree of correlation with actual service performance has not yet been definitely established, work toward this end is now in progress.

— National Bureau of Standards Summary Technical Report 1910.

★ ★ ★

Standard Samples and Reference Standards. National Bureau of Standards Circular 552; 23 pages. Price 20 cents. Available from the Government Printing Office, Washington 25, D. C.

This circular contains a descriptive listing of the various standard samples issued by the National Bureau of Standards. A schedule of weights and fees, and directions for ordering are included. Summarized tables of analyses are presented to indicate the type of standards of composition presently available.



White glove test proves K-8 cleans deep—removes smut

SMUT KEEPS REJECTS HIGH in many plating shops. But the toughest impacted soils and smut are no match for new Pennsalt Electrocleaner K-8. Where other cleaners fail, K-8 gives consistently brilliant results—cuts rejects to the bone, eliminates costly extra buffing, prevents roughness and dulling of the plate.

Pennsalt Electrocleaner K-8 is a highly conductive alkaline detergent; it lets maximum current flow at economical voltages. Here is a new concept of *synergistic* surface-active agents that work equally well on steel or copper.

Call your nearest Pennsalt service man for an interesting demonstration of K-8. Or write about your toughest metal cleaning problem to Metal Processing Department, Pennsylvania Salt Manufacturing Company. EAST: Three Penn Center Plaza, Philadelphia 2, Pa.; WEST: Woolsey Building, 2168 Shattuck Avenue, Berkeley 4, California.

Pennsalt Chemicals

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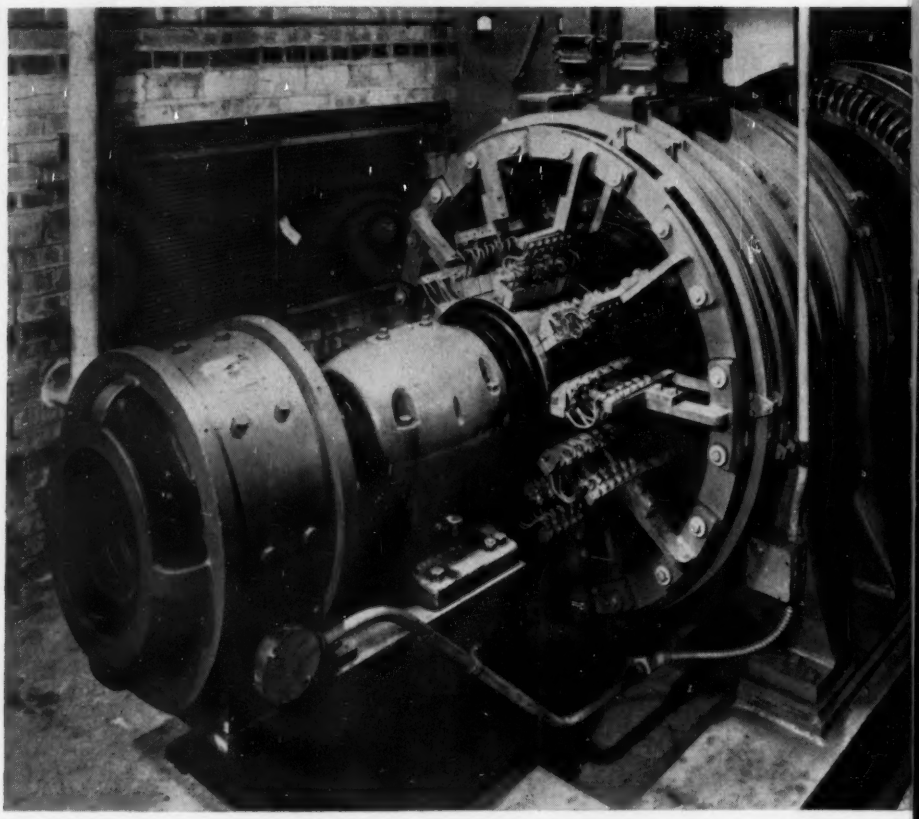

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BE SURE OF POWER WHEN YOU NEED IT MOST... overload capacity as great as 50% momentarily and 25% sustained, without distress or damage.

ENJOY LIFETIME POWER DIVIDENDS... sustained, lifetime overall constant efficiency as high as 85% does not decrease with age or overload.

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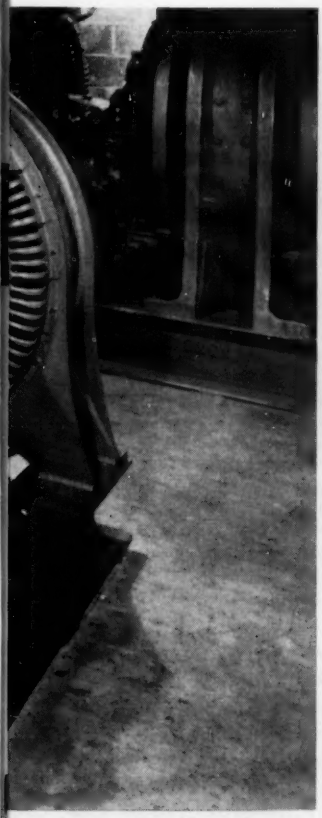

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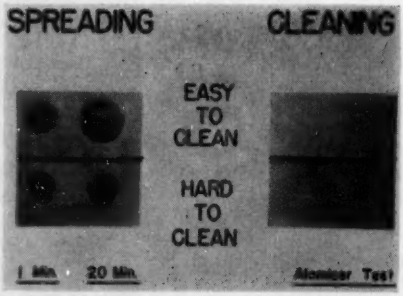
A Test for Predicting Oil Removal Difficulty

THE SPREADING RATE of an oil on metal can now be used to predict how difficult the oil will be to remove. The test is of particular value to metal fabricators, electroplaters and other metal finishers who usually use oils of unknown chemistry. These oils, while essential to metal working and corrosion prevention, must be removed before painting or electroplating. According to Professor Henry B. Linford of Columbia University, it is not necessary to know the composition of oils used for lubrication, cutting aid or rust protection in order to tell how hard it will be to clean a metal. The user will now be able to test an oil by watching how fast a drop spreads over a clean sample of the metal.



Panels used to show relation of oil spreading rate to ease of cleaning. The bottom half of the metal sheet on the left shows how spreading rate is slow for an oil which bonds tenaciously to metal surface, making removal difficult. Top half shows spreading rate with equal size drops of a different type oil. Top and bottom halves of metal sheet on the right were covered with same oils as in left panel, given mild cleaning and then inspected by the atomizer test. The droplets of water show where any residual oil film remains.

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Laboratory work on metal cleaning, sponsored by the American Electroplaters' Society, discovered evidence that such a relationship might exist. Further work by Columbia has very definitely developed the relationship between ease of oil removal and its spreading rate. The rate for any oil was found to depend on the roughness and the kind of metal being used. The development of cutting tool coolants and lubricants that are more easy to remove may speed industrial production without loss of tool life.

This important study will be extended to cover greases and similar materials according to the Society which supports and directs an extensive industry sponsored research program at a number of institutions.

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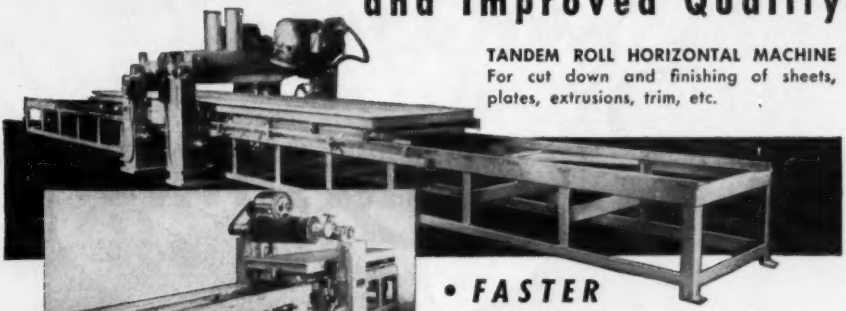

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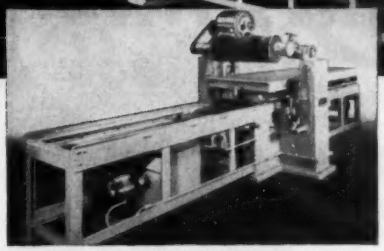
For cut down and finishing of sheets, plates, extrusions, trim, etc.



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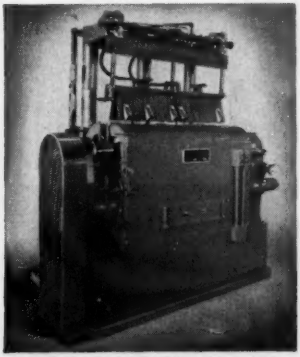

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Spotlighting FINISHING Progress

The Prevention of Cracking in Nickel Electrodeposits

By Dr. C. Fred Gurnham,
Head, Dept. of Chemical Engineering,
Michigan State College

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

THE PREVENTION of cracking in nickel electrodeposits was discussed by T. E. Such, of Wilmot-Breeden, Ltd., Birmingham, England, at the Fourth International Conference on Electrodeposition and Metal Finishing. Mr. Such reviewed the importance of internal stress and ductility, and the relation between these properties, as factors affecting the development of cracks.

The test method for stress involved electroplating on steel strips in the regular production bath, using special holding jigs. Curvatures of these strips, with and without the nickel deposit, were measured to determine stress. Ductility was determined by depositing nickel on steel tensile-test strips, then stretching these strips slowly until cracks appeared. Details of both tests are given in Mr. Such's paper.

Experimental work was conducted on several types of nickel plating solution, generally with organic brighteners present. In the absence of such addition agents, crack-

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ing is not difficult to control.

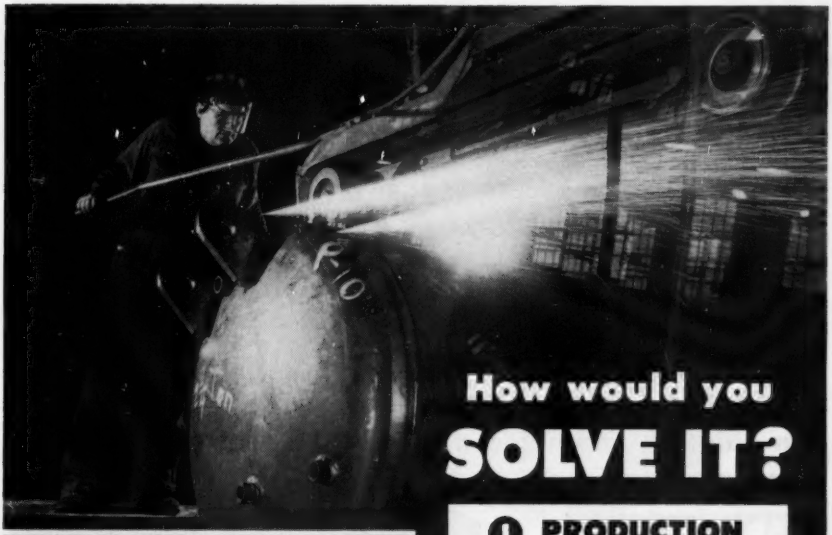
Production Control

The test methods developed for stress and ductility determination were applied to nickel solutions in regular production, over a period of several months. Wide fluctuations in both properties were evident. It was recommended that, when a system of production control is established, frequent tests should be made in order to determine the probable range of these properties.

Reasons for the wide fluctuations are, to a large degree, unknown. In one particular solution, tested approximately weekly over a 3-month period, stress varied from +1800 to +19,600 p.s.i., and ductilities ranged from 4 to 15 (relative units).

Regular additions of a proprietary anti-stress chemical were made to certain baths. The effect of additions was not immediately apparent, but stress was lowered after several hours. The effective life of this chemical was short, hence routine regular additions were desirable. Test samples for stress determination should be prepared at a fixed time interval after chemical additions.

In spite of the most careful solution control, unexplained cracking occasionally appears. This may be due to local or temporary variations in plating conditions; for



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example, in current density or temperature. Also, because of the short life of anti-stress agent, the stress may increase appreciably in the time between additions. In a solution operated for two shifts, once daily additions were found not adequate.

Correction of Cracking Conditions

Occasionally the internal stress of electrodeposited nickel increases while ductility remains good. Addition of anti-stress agent, in certain types of solution, may correct this situation before cracking appears in the production work. This illustrates the advantage of making separate determinations of stress and ductility, instead of waiting for cracking to appear.

When ductility decreases to a low value, or when the stress ductility ratio approaches the critical limit, the nickel solution should be purified. Purification is usually accomplished by hydrogen peroxide and activated carbon additions and by filtration after increasing the pH. Organic addition agents must be replaced after carbon treatment.

Metal contamination can sometimes be eliminated by extended periods of low current density plating, or "dummying." This practice often serves both to increase ductility and to lower internal stress, especially in cobalt-nickel solutions.

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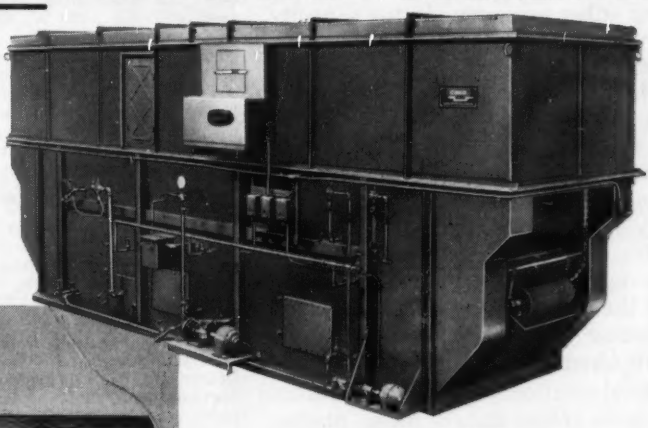

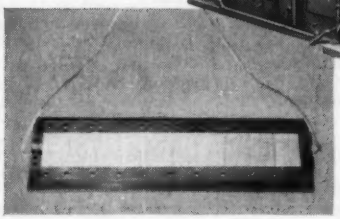

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All remedial operations are empirical, and must be applied on a trial-and-error basis. Mr. Such pointed out the desirability of having either excessive plating capacity or a supply of spare solution, in order not to hold up production while the faulty solution is corrected at leisure.

Since this paper was presented, Mr. Such has reported that regular routine checks for stress and ductility have proved increasingly valuable. Two men are employed solely to determine the physical properties of the nickel plate produced from 60 plating tanks. Results so obtained are often more useful than conventional solution analyses in determining the actual state of nickel plating solutions.

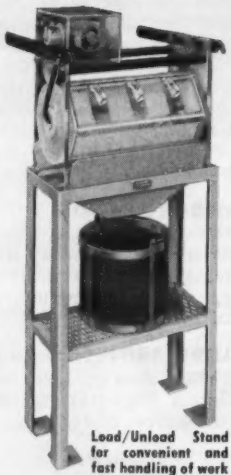
SOME ASPECTS OF TINNING BY IMMERSION PROCESSES. A reprint of a paper by D. E. Weimer and J. W. Price, presented to the Institute of Metal Finishing at Northampton Polytechnic, London, can be obtained from **Tin Research Institute, Inc.**, 492 W. Sixth St., Columbus 1, Ohio.

This paper covers the deposition of tin by chemical displacement; that is, without application of current. This is done by one of two methods, simple immersion tinning or contact tinning. Solution compositions and treatment procedures are given for both methods.

★ ★ ★

A LIST OF AMERICAN STANDARDS. 1955 edition. This publication, which may be obtained from the **American Standards Association,** 70 East 45th St., New York 17, N. Y., lists and indexes about 1500 American Standards. There are lists pertaining to construction and civil engineering, mechanics, electricity, safety, textiles and wearing apparel, photography and motion pictures, petroleum products, chemicals, metallurgy, gas-burning appliances, drawings, letter symbols and abbreviations, and others.

STUTZ Portables



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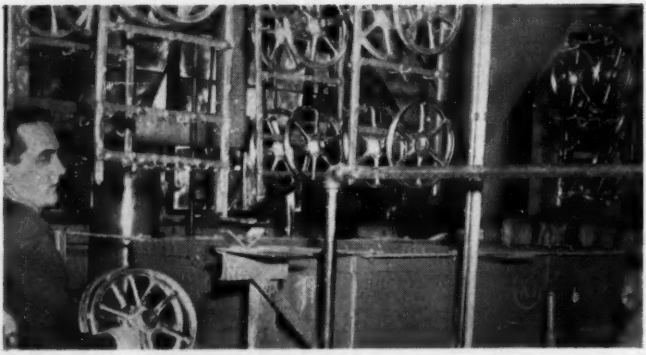
News about UNICHROME
Trade Mark

Platers get improved



Economical, clear chromate finishing is being assured at the plant shown here because the chromate dip is matched both to the product and method of operation.

How to take better action against corrosives

Unichrome Plastisol Compounds can now be applied to any metal surface which can be uniformly baked. This has been made possible by Coating 5300, the first practical *sprayable* plastisol. It builds a protective film 20 mils thick in one coat, or thicker in multiple coats. In combining the chemical inertness of vinyls with the pore-free, seamless, and mechanical protection of its resilient thick film, Coating 5300 can do many jobs for which sheet materials are used, and at less cost.

Protection applied like paint

Various UCILON* Coating Systems, because they're applied like paint, can do many jobs that plastisols cannot do, especially on large structural work. Ucilon Coatings include vinyl, phenolic, fish oil, neoprene, Thiokol, and chlorinated rubber types.

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These coatings are intended for the kind of severe service conditions, high humidity and strong chemical solutions common to plating plants. They stand up, and keep the shop looking better longer . . . and for less money in the long run.

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chromate finishing

Matching of process to requirements simplified with wide line of Unichrome Dips

During chromate treating of zinc, the solution not only creates a corrosion resistant finish, but also strips away some of the zinc and chromate finish just formed. This chemical activity determines thickness of the finish, and therefore its corrosion resistance. It governs color and eye appeal, as well.

Composition of the chromate solution used and the time it has to act on the zinc affect results. Even the shape of the work can affect uniformity of results. The problem then is to get the one right solution for the operation.

THE RIGHT SOLUTION

Platers have found that satisfaction in chromate finishing is assured when the process matches the needs of the product being treated and the production setup.

The unusually wide line of Unichrome Dips permits excellent matching to satisfy all requirements — corrosion resistance, eye appeal, color, type of equipment and the operating cycle.

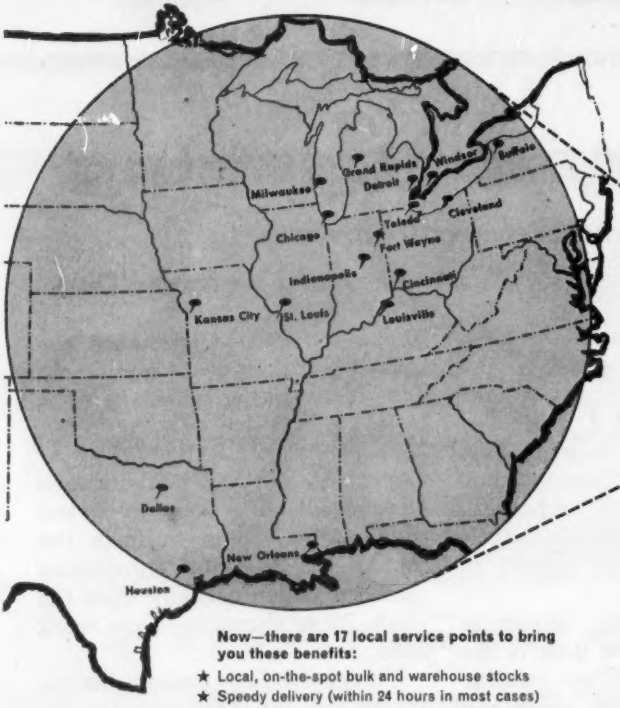
SOLUTION ECONOMY

Chromate solutions contain various ingredients — some to control the solution, some to form the finish. But it is the chromating material which actually does the work. More chromate, more work done.

Unichrome Dips contain the optimum amount of the actual working material with just the right balance of control ingredients. That is why users are able to report materials savings, smaller additions for maintenance of concentration, longer service before discarding, and low cost per sq. ft. of finish.

Contact the nearest office of United Chromium for a chart of all the Unichrome Dips available and the colors produced.

now—**17** points of local service for **solvents and chemicals**



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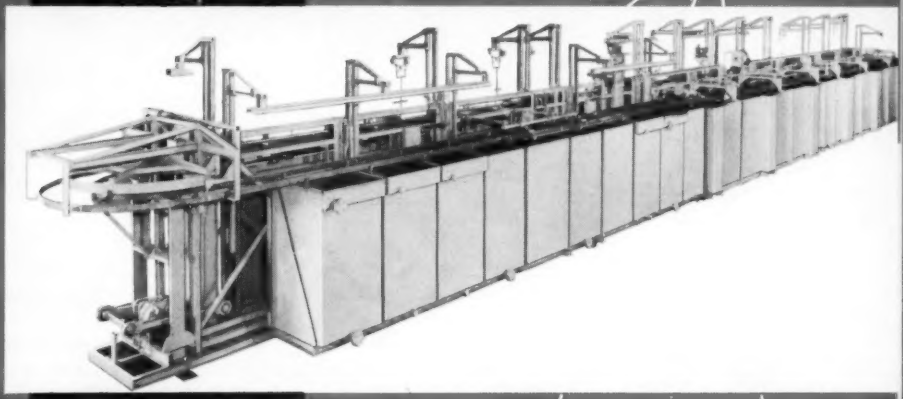
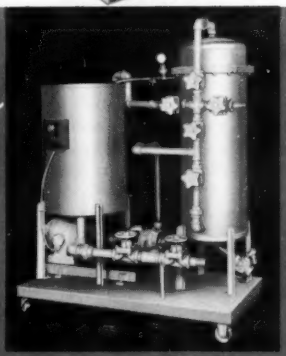
BULLETIN 355

tomorrow's equipment today

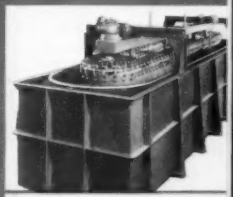
WAGNER BROTHERS

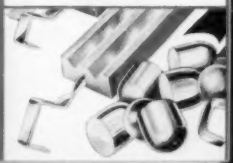
automatic plating equipment and supplies





RECTIFIERS
AUTOMATICS
SEMI-AUTOMATICS
FILTERS
TANKS & LININGS
ANODES
WASTE TREATMENT SYSTEMS





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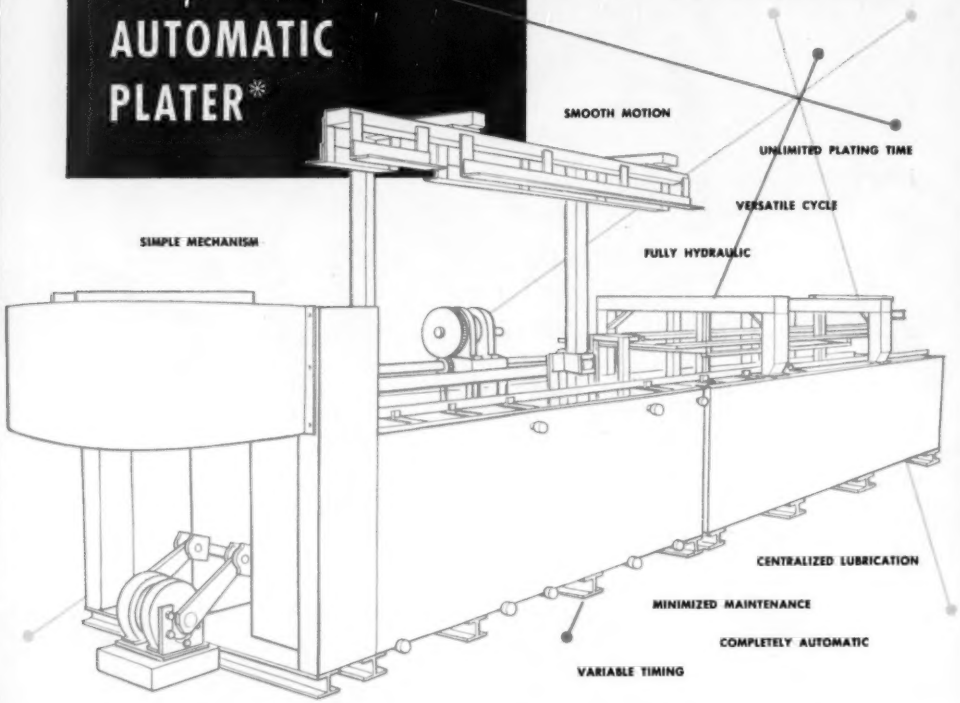
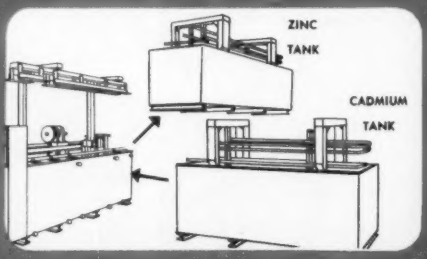
WAGNER BROTHERS *NEW* STANDARD FULLY AUTOMATIC PLATER*

revolutionary concept in plating automation now available to job platers in a standardized model



Automatic operation benefits you by increased production capacity, lowered unit cost and improved quality control—it's faster, cheaper, better.

The *new* Wagner Brothers Standard Automatic now offers you, for the first time, an automatic plater with these *exclusive* advantages:



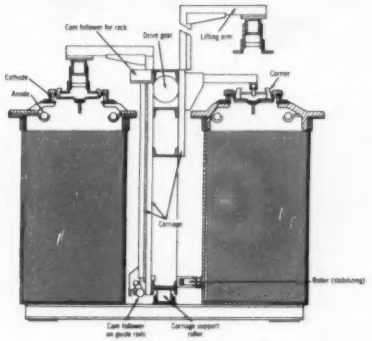
REPLACEABLE PLATING TANK

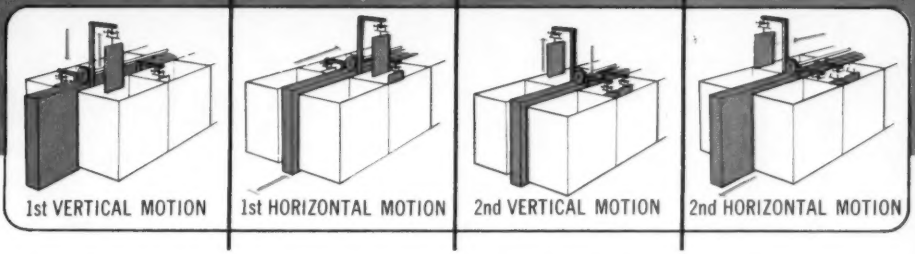
You can *change from plating zinc to cadmium in minutes;* the usual time-consuming tank cleaning operations are unnecessary. Just imagine what you'll save in time and materials. Since all conveying rails are built into the plating tank, you simply pull one tank aside and replace it with a spare. This feature gives you all the versatility of having two automatics.

*PATENTS PENDING

SIMPLE TRANSFER MECHANISM

Unique vertical transfer and return type work conveying design efficiently minimizes number of parts, subsequently reduces chances of breakdown. There are no elevating superstructures, transfer cams, chains and sprockets or hydraulic cylinders over tanks. The carriage is motivated by a hydromotor mounted at the base of the machine, fitted with a crank and link to translate the simple harmonic motion of the motor shaft to the in-line reciprocating action of the carriage.





HOW IT OPERATES — All transfer and conveying mechanism is mounted on a reciprocating carriage located between the two rows of tanks. Two basic motions are used: one forward and reverse horizontal motion of the carriage and a raising and lowering movement of lifting arms attached to the carriage. Plating racks are attached to work carriers at the loading station. When the machine is started, the lifting arms pick up work carriers on one side of the machine, carry them forward to the next station where they are lowered and disengaged. This sequence is simultaneously produced in reverse on the opposite side so that the effect is a balanced work load which requires only low hydraulic pressures.

ELECTRICALLY ISOLATED — The plating tank is a separate unit, electrically isolated from the rest of the mechanism to eliminate possibility of stray currents.

3 POINT CONTACT — The work carrier is designed to give 3 point contact at all times. Constant wiping action on electrified rails keeps contacts clean, assures constant, dependable current flow.

VERSATILE CYCLE — You can have as many as seven stations in both the pre- and post-plating cycle. Tanks are sectionalized at the factory to your particular needs.

SMOOTH PARTS TRANSFER — Our hydromotor power principle *eases* parts through their cycle without jarring them loose from carriers into the tanks.

MINIMIZED MAINTENANCE — All these features vastly minimize maintenance needs: fewer moving parts to wear, no vibration or backlash in automation, no hydraulic cylinders over tanks to contaminate solutions, centralized lubrication, built-in overload protection, working parts easily reached without disassembly, uses only low hydraulic pressures because of balanced work load, and many more.

SIMPLE INSTALLATION — Unit is delivered to your plant intact or in two completely assembled sections. You avoid costly installation.

WRITE NOW FOR COMPLETE TECHNICAL DESCRIPTION, QUOTATION

WAGNER BROTHERS, INC.

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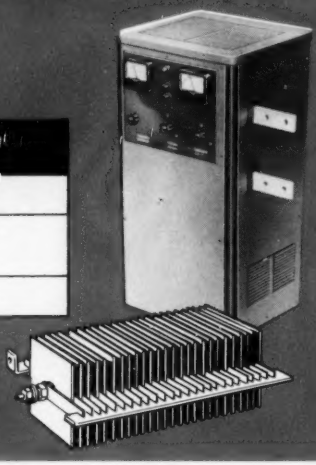
FACTS YOU SHOULD KNOW ABOUT SELENIUM RECTIFIERS

Don't be misled by extravagant claims and technical gibberish about stack rectification areas—

HERE ARE THE FACTS

CIRCUIT	STACK RECTIFYING AREA WAGNER BROTHERS	STACK RECTIFYING AREA OTHER MAKES
3 Phase Half Wave	5.4 sq. in./amp.	3.2-4.5 sq. in./amp.
3 Phase Full Wave (6 Phase)	5.4 sq. in./amp.	3.2-4.5 sq. in./amp. 3-3.7 sq. in./amp. and I.P.T.*
3 Phase Bridge Circuit	8.4 sq. in./amp.	6.0-6.5 sq. in./amp.

*Inter Phase Transformer



On a directly comparative basis, Wagner Brothers Selenium Rectifiers have up to *40% more rectification area* than most competitive selenium rectifiers now on the market—up to 8.4 sq. in./ampere compared with a maximum of 6.5 sq. in./ampere found in competitive models.

WHY MORE RECTIFICATION AREA? — Ample stack area insures higher rectifier efficiency, longer stack life (reduces chances of burn-out), lower temperature rise and ample capacity for overloads.

SUPERIOR STACK CONSTRUCTION — Rectifier cells are selected with the best of electrical characteristics, being made with double collector type assembly to guard against paint between collector contact and the cell which might form either an open circuit or high resistance at the contact. Stacks contain solder type terminals to the bus bar to eliminate possibility of loosening bus bar after hot and cold cycle operation.

LOWER TEMPERATURE RISE — The life of a selenium cell is dependent upon the temperature at which it is operated. The maximum safe operating temperature is approximately 70° C. (158° F.). Wagner Brothers Rectifiers operate with an average temperature rise of only 15° F., thus, in an ambient temperature of 100° F., the temperature will not exceed 115° F.

ADEQUATE OVERLOAD FACTOR — Our tests indicate that the maximum safe operating temperature is not reached until our rectifiers are overloaded to 500% of normal rating. Even in the event of a fan or cooling failure, adequate stack area permits operation of the rectifier without exceeding the maximum safe operating temperature.

HIGHER EFFICIENCY — Since the heat produced in a rectifier represents a loss of power, a reduction of the amount of heat contributes to the substantially higher operating efficiency of the Wagner Brothers Rectifier.

LONGER LIFE — Service life ratings are normally obtained by testing rectifiers during operation with only convection cooling—the anticipated service life being approximately 25,000 hours. Most rectifiers are forced air cooled; the anticipated normal service life is determined generally by increasing the current density 2½ times the convection rating. Wagner Brothers Rectifier service life is based on a current density of 1.6 times the convection rating and permits a use life far in excess of the usual 25,000 hours.

STANDARDIZED STACK DESIGN — All stacks are of a standard design and are interchangeable, either singly or in groups, in all Wagner Brothers standard rectifiers.

BEST INSULATION — Transformers used in our rectifiers are provided with Class B non-flammable insulation (glass, mica, asbestos, etc.) for safety and extra long service life. Transformers are specially designed for electroplating applications.

ALSO A COMPLETE LINE OF REGULATORS AND CONTROLS

Write now for free, illustrated Bulletin B 20-54 describing all types of Wagner Brothers Selenium Rectifiers and controls.

WAGNER BROTHERS, INC.
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LITHO IN U.S.A.

LOW COST PRODUCTION AND HIGH QUALITY WITH SLY CONVECTIONEERED OVEN

Drying oven with silhouette plates removed to show interior of oven. Baking oven is directly behind the instrument panel cabinet.

In order to meet the increased demand for its products, a prominent fan and blower company recently renovized its metal products finishing department.

The company installed two Sly Convectioneered Ovens: (1) a water dry-off oven — 24'-8" long, 9' wide, 8' high — to remove the moisture from the parts after leaving the washer and (2) a paint baking oven — 64'-8" long, 9' wide, 8' high — located adjacent to the dry-off oven.

Both ovens have the same basic design and differ only in length and heater capacity.

Automatic temperature and safety controls are part of the air heater equipment and protect the systems against flame, fuel, power, or mechanical failure. Actual runs show that from a room temperature of 70° F. a temperature of 350° F. is achieved in 12 minutes and maintained uniformly. Both drying and baking ovens are set up for 8-minute cycles.

Results of this installation: production materially increased and better finishes obtained, at very substantial savings! *May we discuss your requirements with you?*

Designers and Manufacturers of Dust Control Systems — Blast Cleaning Equipment — Tumbling Mills — Industrial Ovens.

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Practical Applications of modern products

Amorphous Phosphate Coatings From Metabond Bath

By J. A. HENRICKS
Director of Research
International Rustproof Corporation

TO MEET the production needs of industry for a sludgeless zinc phosphatizing process the research chemists of The International Rustproof Corporation, Cleveland, Ohio, developed a process called Metabond.

When zinc di-hydrogen phosphate solutions are heated up beyond 160 deg. F., they hydrolyze to create free phosphoric acid and throw out insoluble tertiary zinc phosphate precipitates. Schuster and Krause (1) showed that from ¼ to ½ of all phosphate and from 1/6 to ½ of all the zinc added to zinc di-hydrogen phosphate coating baths as replenisher was thus lost as insoluble zinc phosphate sludge.

The new type bath uses a composition based upon infinitely soluble zinc salts dissolved in a buffered phosphoric acid base (4). Acidified solutions of highly soluble zinc salts can be heated to boiling without any precipitation, so that zinc phosphate sludge is eliminated in this new type zinc phosphatizing composition.

In the Metabond bath, the dissolved iron is held in solution as a soluble complex and partially deposited with the zinc-phosphate-rich coating. No powerful oxidizers are present in these coating compositions to precipitate ferric phosphate sludge; although in spray baths, which are saturated with dissolved oxygen, some ferric phosphate is thrown down during operation.

In addition to the elimination of sludge and the resultant loss of soluble coating chemicals, these new compositions are designed to deposit zinc phosphate in a homogeneous layer that is highly flexible and adherent and forms the base for a high gloss on a painted surface (4). This smooth homogeneous coating has been found to be amorphous by electron beam diffraction, although coatings can be obtained by variations in the addition agent concentration that will range from finely crystalline, through micro-crystalline, to the true amorphous. The grain refinement brought about by the addition agent system is believed to be a colloid phenomena that is similar to the mechanism occurring in bright electroplating (2). Phosphate coating is believed to be an aqueous Wagner (3) tarnish phenomena in which the work surface acts as an anode, the coating-to-solution interface as the cathode and the coating as a semiconductor furnishing cations while the capillaries in the coating act as salt bridge conductor to close the circuit. The writer has found that a balanced zinc phosphate bath dissolves about one mole of iron for every mole of tertiary zinc phosphate deposited as $Zn_3(PO_4)_2.4H_2O$, while a high free acid bath with a 1:4 ratio dissolves more iron than it deposits zinc phosphate, and a supersaturated bath with a high ratio of 1:20 obtained by sodium hydroxide additions will coat out more zinc phosphate than it dis-

solves as metallic iron.

The outstanding advantages of the amorphous zinc phosphate coatings are high flexibility under deformation, high coating lustre, and superior corrosion resistance.

While the amorphous zinc phosphate is ideally suited and most widely used as a paint base, it has been used very successfully as an undercoat for drawing. When a highly reflective finish is desired after drawing, as in the case of flat polished bumpers for bright nickel plating or in hydraulic shock absorber tubing, this finish is ideal.

By formulating the Metabond bath upon infinitely soluble zinc salts in a buffered phosphoric acid base, various ratios of zinc to phosphate can be used over and above the 1 to 3 limitation. By the choice of a pre-selected degree of zinc to phosphate saturation, coating weights ranging from 100 to 3000 milligrams per square foot can be obtained to give any coating weight desired.

In general, the heavier coatings are principally used for lubricant bases in cold extrusion or on bulk or barrel coated work that is to be painted by dip-coating and centrifugal spin-off.

When Metabond is used, the work is first made chemically clean in a heavy duty alkaline cleaner as it would be if the same work were to be electroplated, and any crystalline grain refinement is obtained by addition agents to the bath. Sand blasting and solvent vapor degreasing are desirable surface cleaning methods which can be used.

Since these new baths are stable against hydrolysis and thermal sludge, live high pressure steam (40-60 p.s.i.) can be used as the source of bath heat, using a steam sparger with the resultant condensate making up for evaporation and slightly diluting the bath to a low total iron threshold.

Conventional methods of analysis are used with this process consisting of the titration of a 10 ml. bath sample with 0.1 N NaOH using methyl orange-xylene cyanole indicator for free acid, and phenolphthalein indicator for total acid in the same sample. Ferrous iron is determined in an acidulated sample with 0.2N $KMnO_4$. In the amorphous zinc phosphate baths, the addition agent is determined by a sample titration. A 5 per cent chromic acid bath

"It happens every time I put on the Primer Coat."

is used to strip the coating to determine coating weights by the weight loss-area method.

A dry powdered chemical is used for the spray Metabond baths to achieve economy. By the use of this dry powder mix, only one chemical is used to make up and maintain the coating bath. The spray baths are used in conventional five-stage equipment, containing alkaline cleaning, phosphatizing, and chromic rinse stages with intermediate water rinses. The usual 4 to 6 oz. per 100 gallon chromic acid rinse is used, although in special cases a pyridine dichromate rinse is utilized (4).

It should be pointed out that the non-sludging type zinc phosphate bath and the novel features of the amorphous zinc phosphate coating are the subject of patent applications (4).

This new zinc phosphate process has met with commercial success in the fields of dip, spray, and barrel phosphatizing as encountered in paint base, deep drawing and extrusion, and in heavy rustproof applications.

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2. J. A. Henricks, Metal Finishing, V 41, No. 3, pg. 134, V 41, No. 4, pg. 202, 1943.

3. Carl Wagner—Trans. Faraday Soc. V 34, pg. 851, 1938.

4. U. S. Patent Applications.

For more data circle 1 on Reader Service Card

★ ★ ★

Maytag Uses Crack-Free Chromium Plating Process

LAST FEBRUARY MAYTAG put into operation the first mass-production plating line using the Unichrome Crack-Free Chromium plating process.

A nine-tank automatic machine plates 0.3 mil of Crack-Free Chromium directly on steel or solid copper. In this way, 15 parts, including shafts, pivots, tubing, stems and retainers used in automatic washers and dryers are protected against corrosion and wear.

The first report on a bath depositing Crack-Free Chromium, that is, a plate free of cracks characteristic of chromium deposits, was presented by R. Dow and J. E. Stareck of United Chromium, Inc., in a paper before the American Electroplaters' Society, in 1953.

To prove the suitability of the Crack-Free Chromium process, a test program was undertaken at Maytag extending over more than a year's time. Fifty specimen shafts with machine ground bearing surfaces were sent to the pilot plant of United Chromium in Detroit, where they were plated with 0.3 mil and 0.5 mil of Crack-Free Chromium. Maytag's research engineers then set up a physical and corrosion test program for the sample parts.

Test results proved favorable. In corrosion resistance the Crack-Free Chromium showed excellent results. One of the corrosion tests was exposure to 100 per cent humidity at 120 deg. F.

Table I

No.	Cycle	Time (Seconds)	Rack Spaces	Tank Length (in.)	Tank Volume (gal.)
1	Anodic clean	170	6	106	640
2	Rinse and Spray	10	1	45	125
3	Rinse and Spray	10	1	45	125
4	Anodic Etch	5-50	3	58	350
5	Chromium plate	1290	34	590	3500
6	Drain-Fog Spray	10	1	22	—
7	Rinse and Spray	10	1	45	125
8	Rinse and Spray	10	1	45	125
9	Soluble Oil	10	1	22	125
10	Load and Unload	130	3	120	—

The test samples were unaffected after a full year of continuous exposure under such conditions. Also, there was no significant difference in corrosion resistance between the 0.3 and 0.5 mil Crack-Free Chromium.

The final test was a three-month operation of a pilot production plating line. Conventional equipment and procedures were followed; the difference was essentially in the bath, which was United Chromium's Unichrome CF-500 plating solution. It is a chromic acid type bath having automatic regulation

Fig. 1—Parts being loaded on the racks of a chainless type fully automatic plating machine. Conveyor transports the parts through nine tanks.

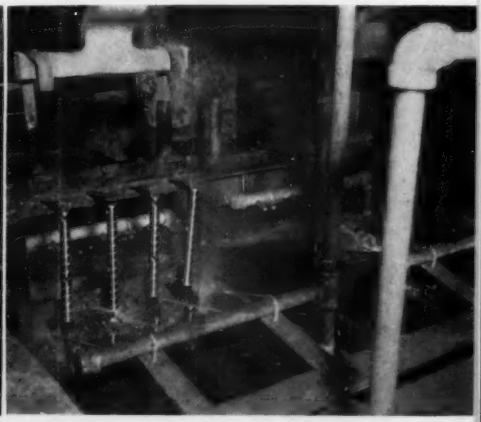

Fig. 2—Appliance parts here are being rinsed in the rinse and spray tank of the automatic plating machine. Parts have been anodically cleaned.

of the catalyst concentration. The pilot operation was satisfactory and good quality deposits were obtained. Leveling characteristics were particularly good. Before plating, the steel had a finish of 30-50 RMS. After 0.3 to 0.4 mil of CF-500 were plated, the finish had a Brush Analyzer value of 3-7 RMS.

Temperature control proved to be the most critical factor in obtaining high quality deposits. So long as the temperature was held closely at 150 deg. F., operations were found to be satisfactory, other factors being properly controlled. The process is now used in regular production.

Chromium plating at Maytag is done in a chainless return type fully-automatic plating machine (Fig. 1). The cycle includes anodic clean, two rinses and sprays (Fig. 2), anodic etch (Fig. 3), chromium plating (Fig. 4), drain-fog spray, two rinses and sprays, and a soluble oil dip. The soluble oil is used to protect interior and unplated portions of the parts. Parts are end loaded and unloaded. Process cycle details are listed in Table I. Anodes are spaced on 18-inch centers, plating tank racks on 16-inch centers, and transfer racks on 22-inch centers. Each hook is rated at 1800 amperes. At full capacity, the plating line will take 25,000 to 30,000 amperes at 8 volts.

Specifications call for a 0.2 to 0.4 mil Unichrome Crack-Free Chromium plate, which is deposited in 18 to 20 minutes. The plating speed is slightly better than 0.9 mils/hr. at a current density of 3 a.s.f.

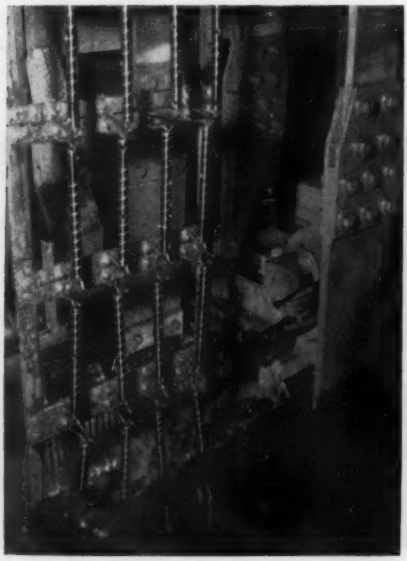

Fig. 3—Racked parts suspended above anodic etching tank. Etching time is 5 to 50 seconds, after which the parts are ready to be chromium plated.

Fig. 4—Conveyor in the "down" position in the chromium plating tank, where articles being plated receive a 0.3 mil deposit of crack-free chromium.

Because close temperature control is required, a special control system was devised that keeps the temperature at 150 deg. F. plus or minus 1 deg. The control system consists of a three-way valve operated through a standard type temperature controller. A blend of hot and cold water acts as the cooling or heating medium in an evaporative cooler. Temperature is controlled quite precisely. Currently, some fifteen different parts for automatic washers and dryers are being plated with Crack-Free Chromium. The parts range in length from 1.75 to 17 inches; and in diameter from 0.37 to 1.25 inches. Except for a pivot, which is of solid copper, all the parts plated are steel.

For more data circle **2** on Reader Service Card

Electrostatic Finishing of Lighting Fixtures

By R. H. SHAFFER
Works Manager, Fluorescent Fixtures of Calif., South San Francisco, Calif.

THE MANUFACTURE OF fluorescent fixtures is divided into three principal operations: metal fabrication, cleaning and finishing, and final assembly. Of the three, finishing is in many ways the most critical. In addition to making a good appearance, the baked white enamel surfaces must have a high reflectivity with a minimum of variation and good durability. If the finish has good appearance and reflectivity, but does not hold up in service,

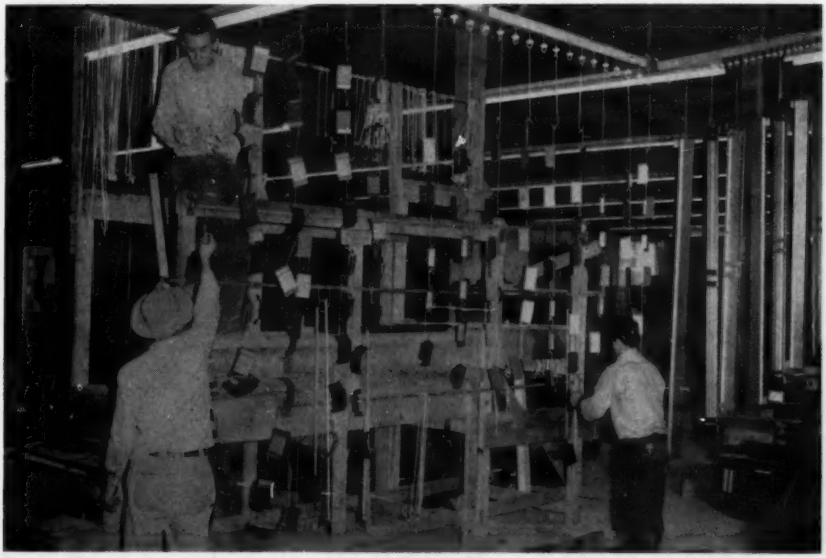

Fig. 1—Loading zone, where parts are placed on conveyor, which carries them through the multiple stage washer and dry-off oven, and then through electrostatic spray painting. During loading, the conveyor is at a 10½ foot elevation, then rises to 14½ feet to enter the washer.

it is unsatisfactory. For these reasons it is important that every effort be made to produce the desired results in mass production but with complete quality control.

In producing All-Brite lighting fixtures, a conveyorized multiple-stage washer is used. This machine was designed to handle parts up to 10 feet long when hung vertically. A capacity of 15 tons of sheet metal per shift can be handled.

The finishing system employs 425 feet of Richards-Wilcox No. 2035 conveyor running at 6 feet per minute. During loading it is at a 10½ foot elevation, then runs up to 14½ feet to pass through the 68-foot long washer and dry-off oven. Washing and phosphatizing is done as follows:

1. Spray wash and phosphatize in Oakite Cryscoat No. 89 held at 155 deg. F.
2. Rinse in warm water: 145 deg. F.
3. Spray rinse in cold water.
4. Spray rinse in a chromate solution held at 175 deg. F.
5. Dry in an oven at 350 deg. F. for 2½ minutes.

Thereafter, the conveyor drops down to a 12 foot elevation during a 3 minute cool-down period before it enters the loop of the Ransburg No. 2 Process electrostatic spray zone. This loop is 66 inches in diameter and the parts are hung from either simple "S" hooks or, in the case of some small parts, on special "Christmas-tree" type workholders so that the work is about 18

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DRY CLIME LAMP CORP. Greensburg, Ind.

inches below the rotator. Rotators are placed every six inches so that hanging centers with any multiple of six inches can be used. With this arrangement the eight-foot long pieces are about 18 inches above the floor.

The 25 inch diameter disc, which rotates at 900 r.p.m., moves up and down in the center of the loop at a speed of about 1 foot per second. The parts to be painted are placed on 18 inch centers on the conveyor and rotate about 2 revolutions per foot of conveyor travel so that all sides are exposed to the electrostatic spray. Paint metered through a variable speed gear pump is delivered by a 12 inch outside diameter plastic hose through the inside of the disc rotating motor shaft and is introduced continually and uniformly to the outer edge of the rotating disc on the under side of the disc. The disc itself is charged to about 90,000 volts. Because of the strong field existing between the disc and the work, the paint is caused to atomize into a mist. Each paint particle has a strong negative surface charge. The work, being of opposite polarity, attracts the paint, causing automatic deposition of paint.

When shorter pieces are run through the line, the stroke length of the rotat-

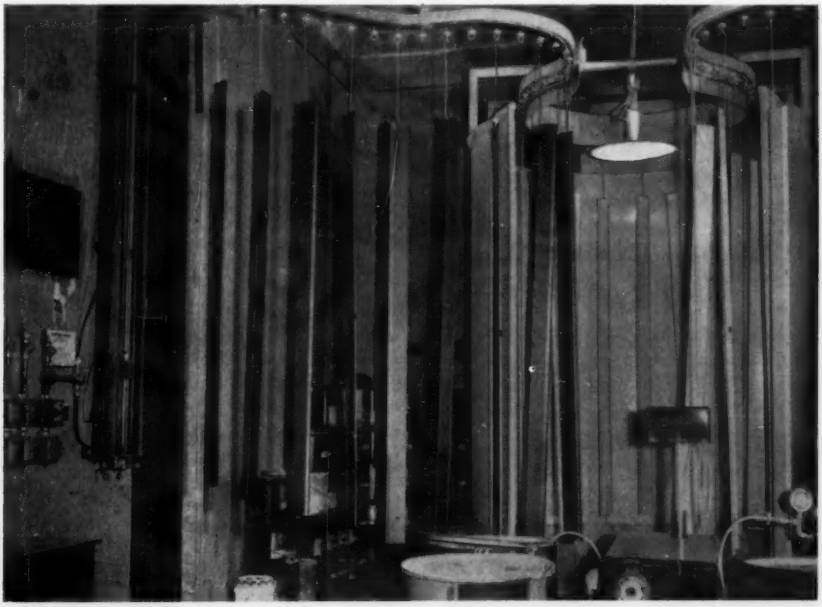

Fig. 2—Overall view of the electrostatic painting setup. Controls at left are for starting fan, conveyor, electrostatic unit, and for adjusting reciprocator stroke length. Articles being painted rotate on the conveyor while moving around the disc. Ransburg paint pumping and metering unit can be seen in the right foreground. Disc (upper right) rotates at a speed of 900 revolutions per minute.

ing disc is adjusted by means of limit switches which are mounted on lead screws. This is done without stopping the conveyor line. Color changes are made by lifting the paint suction hose out of one barrel and putting it into another. A gap of 25 feet is left in the line and the conveyor is not stopped.

The enamel used is a modified alkyd with high reflectance, which for the electrostatic spray is reduced (5 parts paint to 3 parts thinner) to a viscosity of 17 seconds on a Zahn No. 2 cup.

A non-circulating paint heater is used between the metering pump and the disc to help stabilize temperatures. The temperature of the paint on the disc remains at about 90 deg. F. In this way, it is not necessary to make solvent adjustments during the day.

Paint delivery adjustments are made as needed by simply turning a handle, thereby changing the speed of the metering pump. Insofar as possible, parts are hung so as to present the same number of square feet per minute, thereby making a paint delivery change unnecessary.

After traveling through the electrostatic spray zone, parts pass through a 12 foot water-wash touch-up booth where two men spray paint as required. Certain pieces, which have shielded or recessed areas, require touch-up hand spray. This is done at an upper and lower level.

After painting, parts pass through a flash-off zone and into an oven where they are baked for 12 minutes at 300 deg. F. This oven is equipped with entrance and exit air curtains surrounding the oven openings so that practical-

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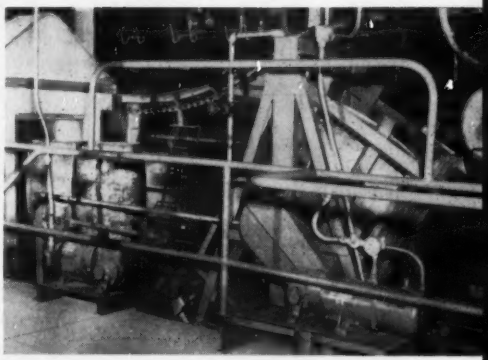
ly no heat is lost to the room.

After baking and cooling down, parts on the conveyor pass by the unloading station which is at the head of the assembly line. The conveyor travels empty from this point to the loading station, a distance of about 75 feet.

A smooth flow of finished goods is obtained by taking in raw materials at the rear of the building, and moving parts forward through fabricating, finishing, and assembly to the front of the building where they are shipped out by conveyors onto trucks. Twelve to fifteen tons of steel per day are handled smoothly and efficiently in producing All-Brite's daily requirements of quality fluorescent fixtures.

For more data circle **3** on Reader Service Card



Drums entering automatic washing machine at the plant of Hercules Powder Company. Mechanism for up-ending the drums as they enter can be seen in the center foreground.

★ ★ ★

Washing Steel Drums Automatically

A COMPLEX CLEANING PROBLEM involving the washing of steel drums at the Parlin, New Jersey, plant of Hercules Powder Co. has been solved by a steam heated washing machine that was designed and constructed for this purpose by the Industrial Washing Machine Corp., Matawan, N. J.

The drums are carried through the machine on a bar conveyor, while the covers pass through at the same time hanging from an overhead monorail, which operates independently. The drums are automatically turned upside down for more efficient cleaning as they enter and are automatically righted as they emerge. Powerful sprays are located on the sides, top, and bottom of the machine to ensure a thorough

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cleaning job.

The machine washes and rinses 120 drums per hour. It is 30 feet long, 7 feet wide, and 8 feet high.

For more data circle 4 on Reader Service Card

★ ★ ★

Chromium Plated Zinc Alloy Die Castings for 1955 Grilles

SIXTY-TWO PER CENT of the grilles which decorate the fronts of the 1955 automobiles are zinc alloy die castings. Finishing is accomplished by polishing to a bright, smooth surface, followed by electroplating for protection and appearance. Grilles are usually copper plated, followed by successive deposits of nickel and chromium, producing a mirror-bright surface. The accompanying photograph shows the grilles of 1955 automobiles which are fabricated from these materials.

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For further data on products mentioned in this issue, use READER SERVICE CARD inside back cover.

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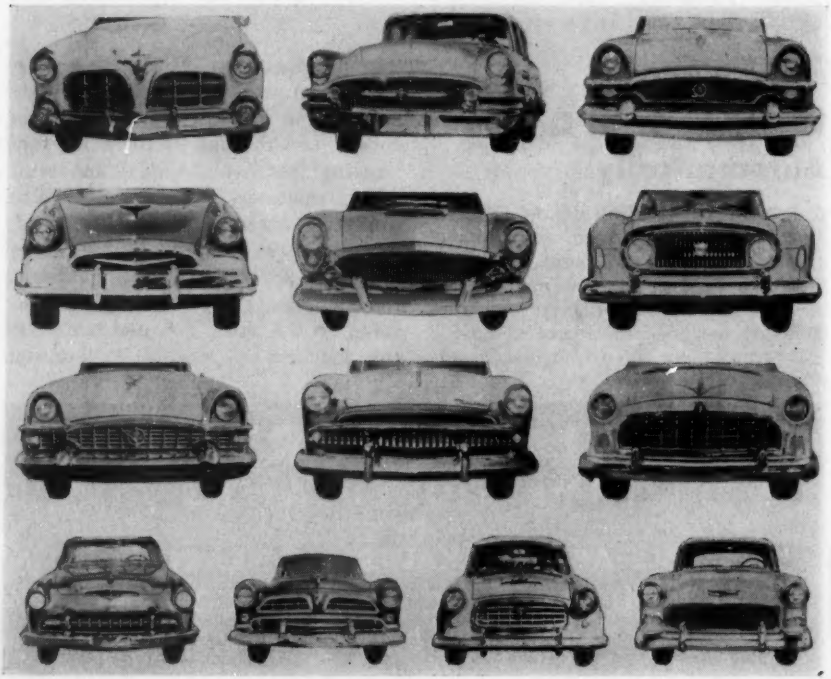

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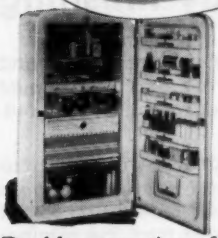
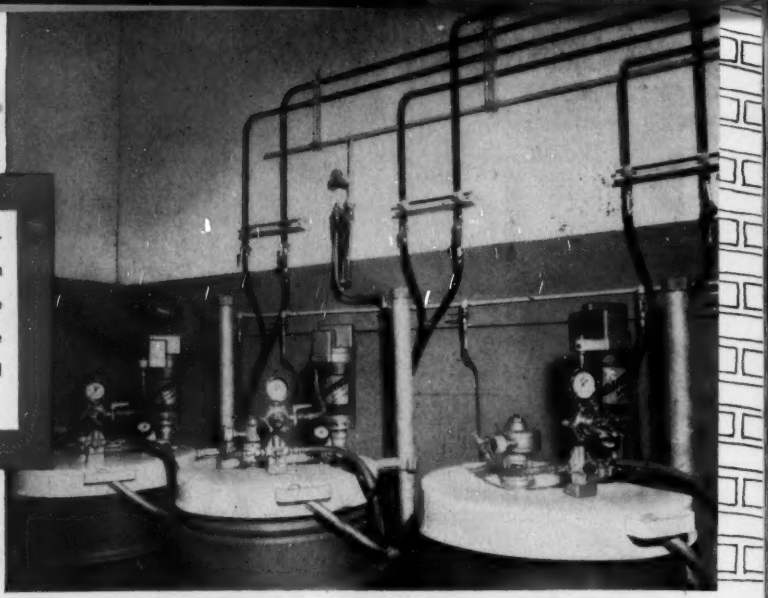


Double protection of KEMCLAD Primer and KEMCLAD Enamel gives Gibson Refrigerators exceptional resistance against foods, chemicals, marring or chipping.

Automatic spray, electrostatically applied, insures a finish on Gibson Refrigerators as uniform as modern equipment can make it. Sherwin-Williams KEMCLAD®, the tough, modern, highly resistant, appliance white enamel, insures long-lasting beauty for Gibson Refrigerators just as automatically.

Whether it's a question of automatic or manual spray finishing of white or colored appliances, prefinishing of strip or sheet stock, production finishing of parts, or "glamour" finishes for specialty products, you'll find Sherwin-Williams technical help equally available and valuable. Investigate what KEMCLAD or other equally outstanding products can do for you. Call your Sherwin-Williams representative, or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.
(In Canada: 2875 Centre Street, Montreal)

SHERWIN-WILLIAMS
Industrial Finishes



Finishing of wood products made by Mullen Mfg. Co. is faster since they installed these three Binks all-new Material Handling Pumps.

AT LAST: material handling pumps

built specifically for spray finishing

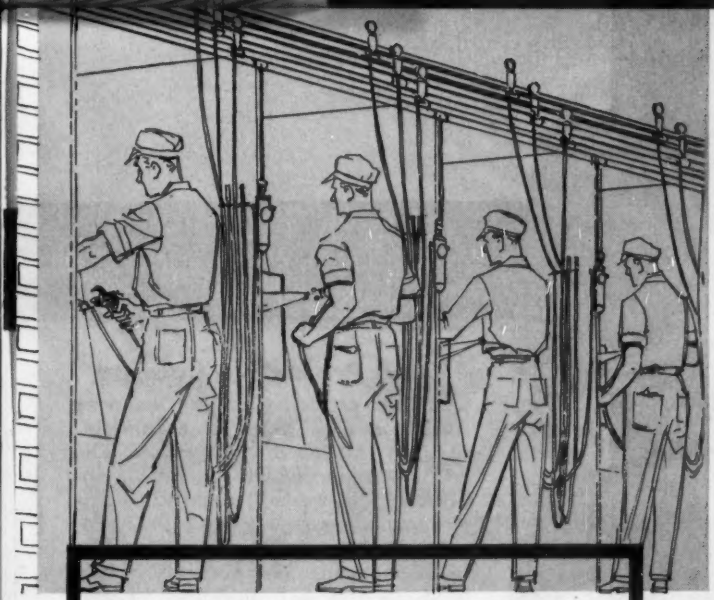
These Binks air-operated Material Handling Pumps are brand new...from foot valves to air valves. Every part is designed and precision made by Binks to give you a pump that outperforms all previous models.

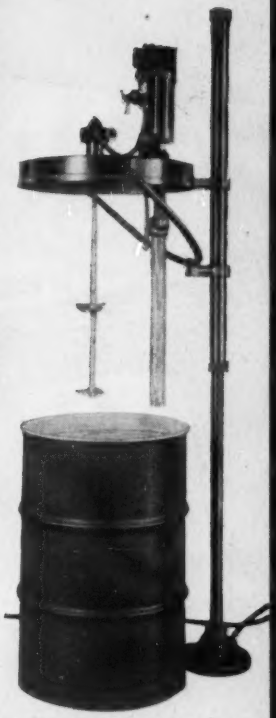
For paint circulating systems—Binks pumps are ideal for use with paint circulating systems of all sizes. If your shop has two or more spray stations you can save money with this equipment. It permits you to spray any type of fluid direct from the original 55 gallon drums.* You eliminate costly paint handling and spillage...you assure identical finishes from every gun...you reduce fire hazard...you have a neater, cleaner finishing department.

For pumping heavy materials—For those who apply sound deadeners, adhesives, protective coatings and other heavy materials, these new Binks air-operated pumps are unequalled. Some materials can be pumped through long lengths of hose or pipe to distant spray guns. Precision manufacture reduces wear and maintenance...cuts operating costs to a new low.

For transferring fluids—Binks new air-operated transfer pump is a light, easy to use unit for pumping paints, thinners, solvents and other liquids from one container to another. It empties a 55 gallon drum of paint in less than 5 minutes.

*Models for 5-10 gallon containers also available.





Binks new air-operated pump lift speeds up the change of drums.

Better "10" ways and here's why:

1. Reserve power.
2. Operates slower *but delivers more.*
3. Saves time—speeds production.
4. Handles wide range of materials.
5. Uniform flow.
6. Superior agitation.
7. No spillage or contamination.
8. Pumps from original 5 or 55 gallon container.
9. Requires no lubrication.
10. Backed by Binks' nationwide service.

FOR FURTHER INFORMATION on these new pumps...see your local Binks representative or write direct to the address below for a free copy of Bulletin 701.

Binks

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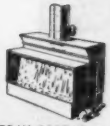
GUNS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Vinyl Protective Coating

A vinyl protective coating featuring single coat application has been developed by Amercoat Corporation. The coating, Amercoat No. 87, can be applied at a thickness of 10 mils in a single double-pass spray coat, thus providing a dense, heavy film. According to the company, No. 87 Vinyl Mastic produces this film thickness without sacrificing the chemical and moisture resistance for which vinyls are known.

Amercoat No. 87 has a high solids content, and the coating is easily applied with conventional industrial spray equipment. An additional feature is that the coating does not flow away from edges and sharp corners, and therefore provides extra protection for such areas which are normally more vulnerable to corrosive attack.

Complete information can be obtained from the Amercoat Corp., 4809 Firestone Blvd., South Gate, California.

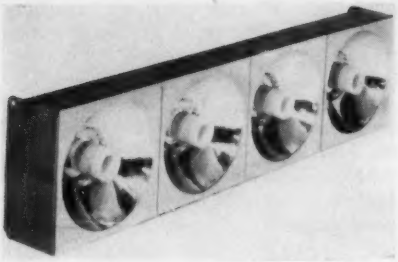
For more data circle **5** on Reader Service Card

★ ★ ★

Baking and Drying Equipment

Six driQuik infra-red interlocking oven sections for baking, drying, preheating, degreasing, curing and other applications have been introduced by the Industrial Division of the Dry Clime Lamp Corp., Greensburg, Ind.

These sections employ driQuik lava-coated ceramic-type infra-red generators. These generators are resistant to



Infra-red Oven Section

shock, vibration and moisture. The lava coating is said to produce a high rate of infra-red heating energy in the wave lengths that produce higher efficiency baking.

The generators are set in solid aluminum reflectors which are designed to produce an even field of baking energy, free from hot or cold spots in the baking area. They are dark burning, eliminating the possibility of hazard due to high intensity light.

The interlocking sections are completely wired and ready for oven assembly. Hinges and adjustment brackets make it possible to construct an oven of any desired shape or contour, as well as a flat design. These ovens can be built for stationary use or can be made to roll on casters.

Positive variable temperature control from 0 to 100 per cent of rated power is possible with the driQuik equipment. Three models of the sections have four infra-red generators each and three models have two each. They contain generators rated at 500, 650 or 750 watts each.

For more data circle **6** on Reader Service Card

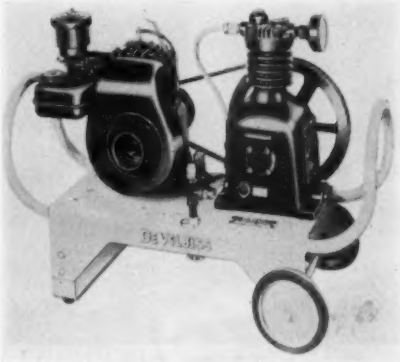
★ ★ ★

Portable Compressor

A portable compressor, carrying the designation PJE-521 when powered by a gasoline engine and PJ-521 when electric motor driven, has been designed for use by smaller contract painters and small shops, by the DeVilbiss Co., Toledo, Ohio.

The unit, rated at ½ h.p., will deliver air at the correct pressure for spray painting and other low pressure uses.

DeVilbiss engineers have designed the air reservoir and condensation chamber to serve also as carrying han-



PJE-521 Portable Compressor

dles for the relatively light-weight unit.

The compressor, easily maneuvered indoors or out, has two rubber tired wheels for moving from place to place.

The unit has a regulating type safety valve which prevents overloading the compressor and provides a means for adjusting compressor air pressures.

The air handled by the compressor is filtered upon entering the unit and is clean when delivered. The tubular handles acting as air reservoir and condensation chamber are drained easily by two valves.

Additional information may be obtained by writing to the DeVilbiss Co., Dept. 318, Toledo 1, Ohio.

For more data circle **7** on Reader Service Card

★ ★ ★

Electropolishing Processes

Electro Glo finishing is an electrochemical polishing process, more commonly known as electropolishing, in which metal is removed rather than deposited, as in electroplating. Stock removal can be controlled within one ten thousandth (0.0001) of an inch.

A series of articles before and after polishing with Electro Glo electropolishing processes.

The method, a product of the Electro-Glo Co., Chicago, Ill., produces satin to mirror bright finishes while simultaneously leveling the surface, and removing burrs and imperfections.

Specific electropolishing concentrates available for various metals are: Electro Glo "200," for copper and copper alloys; Electro Glo "300," for austenitic (non-magnetic) grades of stainless steel; Electro Glo "400," for martensic (magnetic) grades of stainless steel; Ferro Glo "500," for low and medium carbon steels; Ferro Glo "600," for high carbon and tool steels. Concentrates and solutions for other metals and less common alloys are available upon request.

For more data circle **8** on Reader Service Card

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Chemical Resistant Alloy

International Nickel Co., Inc., has announced the development of a high nickel alloy capable of resisting corrosive attack by a large number of acids, acid mixtures, and oxidizing agents. Called Nionel, it contains approximately 40 per cent nickel, 21 per cent chromium, 3 per cent molybdenum, 1.75 per cent copper, 31 per cent iron and small amounts of manganese, silicon and carbon. The relatively high nickel content, plus molybdenum and copper, make this alloy considerably more resistant to hot sulfuric, sulfurous and phosphoric acid solutions than any of the common stainless steels. In addition, the chromium content is sufficient so that when fortified with nickel, the alloy is capable of resisting a wide variety of oxidizing chemicals.

Nionel is expected to find major applications in the sulfuric acid pickling of iron, steel and copper-base alloys, and since it has shown good resistance

DOW

Stampings and other metal parts take plating or painting with fewer rejects, and lower batch and unit costs, when first cleaned with Dow Sodium Orthosilicate.

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Your plating or painting results—and *costs*—are controlled by your cleaning. When Dow Sodium Orthosilicate is used in your dip, soak or electrolytic process, there are fewer cleaning *or* finishing rejects.

This heavy-duty cleaner readily emulsifies oils, fats and waxes. There's *no* redeposition. Dow Sodium Orthosilicate's high acid capacity and high pH give clean, bare parts ready for reject-free finishing.

Solutions of Dow Sodium Orthosilicate have a high electrical conductivity, permitting any current density *without* excessive voltage.

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DOW

to pitting attack in sea water, it should be useful in tubular heat exchangers.

For more data circle 9 on Reader Service Card

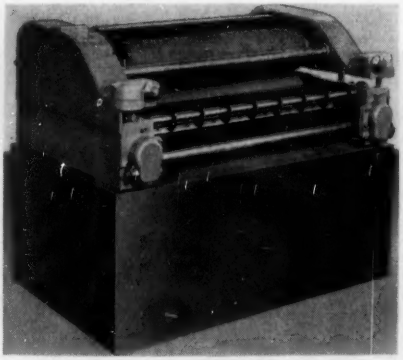
★ ★ ★

Compact Roller Coater

The Murray-Way Corp. of Birmingham, Mich., has announced the development of a Roller Coater Unit for use on sheet metal.

This compact unit is designed to coat both sides of the sheet. Minute adjustments to the correct gauge thickness and coating thickness are easily made with Vernier controls. The roller coater features visual gages for the correct aligning and coating thickness.

Mechanical drives permit removal of the rolls for cleaning without removing, restringing, or resetting the drives. Upper and lower roll assemblies are completely independent, and either can be removed and replaced without affecting the other adjustments of the machine.



Roller Coater Unit

Jamming due to work overlap and resultant machine damage is said to be eliminated by a hinged construction of roller assemblies. Provisions are made for heating the rolls and the unit is fitted with swivel connections.

For complete information, write Murray-Way Corp., Box 180, Birmingham, Michigan.

For more data circle 10 on Reader Service Card

★ ★ ★

Siding Coatings

Watson-Standard Company has announced a white aluminum siding coating. Panels coated with Watson-Standard No. 17-114 white siding show excellent weathering properties.

Based upon modified vinyl resins, this coating may be applied at high speeds and with quick bakes (90 seconds at 400 deg. F.). When applied over properly pretreated aluminum stock no primer is necessary. Formulation of 17-114 makes possible coating of rolled edges and rounded corners without difficulty, the manufacturer states.

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BATES FLOORCOATING (for floors)
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55 gallon drums 80¢ gallon
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How one operator found he could cut "Solution Dumped" by using

New ANACONDA "PLUS-4" ANODES

(Phosphorized Copper)

WHY PLATING WITH "PLUS-4" ANODES COSTS LESS

- **+1** no anode sludge
- **+2** no copper "build-up" in solution
- **+3** smooth, heavy cathode deposits (no "bagging" or diaphragms required)
- **+4** up to 15% more cathode deposit per anode

A large Midwest electrotyper was skeptical when he first read technical literature about Anaconda's revolutionary new "PLUS-4" phosphorized-copper anodes.

So he ran a test in his own shop – a test under his everyday operating conditions. He filled a clean tank with "PLUS-4" Anodes, poured in new solution – then made daily checks. Here's what he found out about copper "build-up" in solution, compared with "build-up" in tanks using anodes of different types:

Type of Anode	Length of Test	Acid Added	Solution Dumped
Ordinary cast copper	23 days	9½ gallons	210 gallons
Ordinary rolled electrolytic copper	23 days	7 gallons	90 gallons
New "PLUS-4" rolled phosphorized copper	**28 days**	**4 gallons**	**45 gallons**

He was also enthusiastic about the other performance characteristics of Anaconda "PLUS-4" Anodes – no sludge – smooth, even cathode build-up – uniform anode corrosion, small "fish" and low scrap loss. But he was *excited* about the savings in "solution dumped," because he was tired of throwing away good copper.

Maybe some other factor is more important to you. Find out for yourself as this operator did. You've nothing to lose and you can save money, time, trouble, and get better work.

For use under Patent No. 2,689,216 56146A

SPECIAL TRIAL ORDER – For details on how you can get a test supply of "PLUS-4" Anodes sufficient to fill one tank, write to The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

"PLUS-4" ANODES

AN ANACONDA® PRODUCT

Made by THE AMERICAN BRASS CO.

Relatively high film weights (1 mil to 1½ mil dry suggested for siding) may be applied in a single coating.

The normal gloss of 17-114 as supplied is 15 to 20 degrees, registered on a standard 60 degree glossmeter. This gloss, however, may be adjusted by the manufacturer as required.

This same basic formulation is available in colors, pastels or deep shades, as well as white.

For further information contact the Watson-Standard Co., 225 Galveston Ave., Pittsburgh 30, Pennsylvania.

For more data circle 11 on Reader Service Card

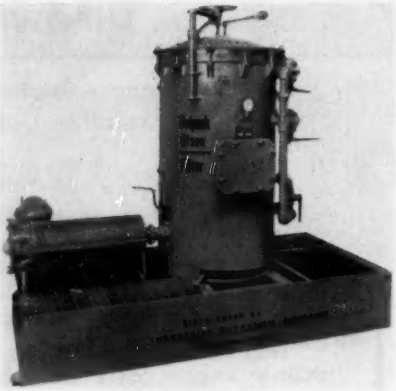
★ ★ ★

Solution Filter

The Delpark-Olson Superflow Filter uses diatomaceous earth with tubular filter elements. Screen elements are precoated with diatomaceous earth forming a filter cake through which passes the fluid.

Cleaning is automatic and is accomplished in 1 to 3 minutes by back washing. Liquid is forced back through the tubular filter elements from the inside. The earth cake is knocked off and allowed to settle to the cone of the filter. Agitation in the cone prevents packing of the sludge.

All operations are simple. The cleaning-out process is done without emptying the filter and is fast, clean and easy. Capacities range to 175 g.p.m.



Delpark-Olson Superflow Filter

For further information, write to George L. Guymon, Industrial Filtration Co., Dept. O-312, Lebanon, Ind.

For more data circle 12 on Reader Service Card

★ ★ ★

Flat Transducer for Ultrasonic Degreasers

A low frequency flat-type transducer developed for Circosonic ultrasonic metal degreasing equipment to improve the efficiency of ultrasonic cleaning methods and extend the size of

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Economical, fast, non-electrolytic.
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Solvents Recovery Service, Inc.
1025 Broad St. Newark 2, New Jersey
Hammond Solvents Recovery Service
241 Brunswick Rd. Hammond, Ind.

Friction Surfaces Need Parco Lubrite

Wear is a problem wherever there is sliding or rolling contact. Parco Lubrite controls wear on metal friction surfaces.

The phosphate coating produced by Parco Lubrite is nonmetallic, provides a separating layer of phosphate crystals that holds lubrication, prevents metal to metal contact during break-in, minimizes scoring and scuffing.

Parco Lubrite is used on shafts, gears, pistons, cylinder liners, valves, rings, and scores of other parts. The inexpensive, simple, quick process gives uniform high-quality results.

The friction surfaces of your product will be improved by Parco Lubrite. Full information is yours on request.

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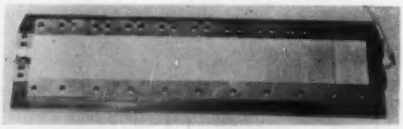
BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL PAINT
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy-duty maintenance paints

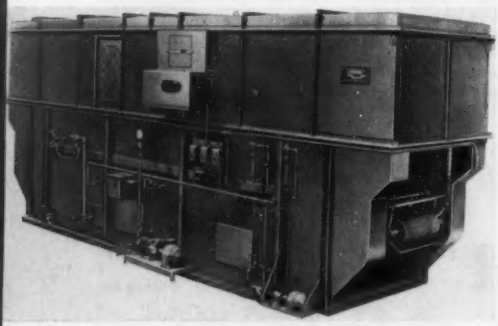


Ten flat barium titanate crystals assembled in one frame provide a compact ultrasonic transducer.

workpieces that can be handled, has been announced by Circo Equipment Company, Clark, (Rahway), N. J.

Low ultrasonic frequencies have greater penetrating ability and therefore greater cleaning efficiency than the higher frequencies previously employed, it is stated. In the Circo equipment, low frequency ultrasonic waves, generated by barium titanate transducers freely curve around corners and sharp angles, penetrate more easily into recesses and capillaries to remove all dirt, oil, grease and chips from the article to be cleaned.

The flat shape of the transducers permits them to be teamed to any length or width for cleaning large shapes such as transmission pumps and gears. Because sound energy is beamed over a wider area, small parts like



Circo cross rod liquid-liquid vapor degreaser with integral ultrasonic chamber.

Circo 2 kw Ultrasonic Generator

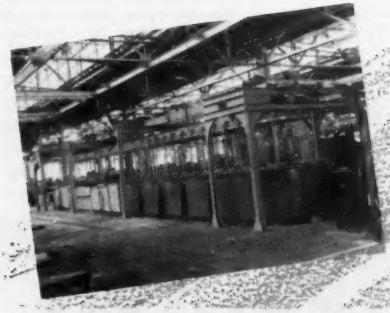
bearings and electronic components can be cleaned ultrasonically without requiring critical positioning.

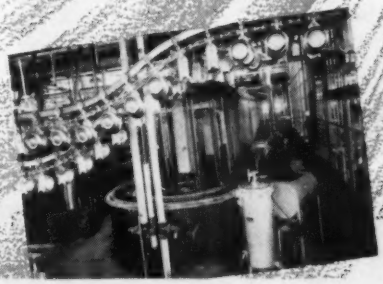
As the transducers expand and contract under electrical excitation, the resulting ultrasonic energy causes severe cavitation in the surrounding cleaning solution, usually trichlorethylene or perchlorethylene. It is this cavitation that actually cleans the metal parts, subjecting them to a rapid scrubbing action. Redesign of the barium titanate crystal transducers permits them to be driven at higher watt densities, so that the sound waves need no longer be focused to produce adequate intensity of cavitation. Thus, it has been found feasible to use flat transducers in production model ultrasonic cleaners.

The transducers are available as standard equipment in Circosonic 500 watt, 2 kw, 10 kw, and 25 kw ultrasonic units, each comprising an ultrasonic generator and an ultrasonic chamber. Units are available separately or integrated with Circo conveyorized or hand operated vapor degreasers. The conventional equipment removes the heavy contaminants while the ultrasonic unit scrubs out all remaining dirt

MEAKER

Automation...





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- Economical Operation
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to meet the most stringent industrial or military standards. Ultrasonic chambers may also be integrated into existing degreasing machines with liquid immersion stages.

Additional information is available from Circo Equipment Co., 128 Central Ave., Clark (Rahway), N. J.

For more data circle **13** on Reader Service Card

★ ★ ★

Protective Coating for Concrete

The Ceilcote Company, Inc., has announced the development of Coro-Crete, a corrosion proof floor material which provides increased protection from attack by alkalis, solvents and acids. Developed for application directly over concrete, the material is composed of three basic ingredients: a thermosetting resin liquid, a hardening agent and an aggregate-type filler.

Concrete floors in this processing area are protected by Coro-Crete corrosion proof floor material.

Developed to meet wide require-

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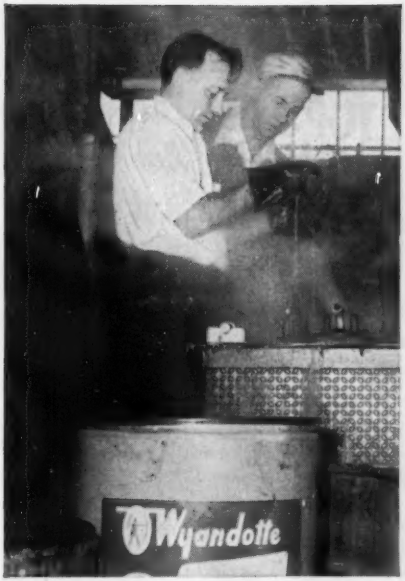
Wyandotte metal cleaners lick job shop's cleaning problems

Any plating operation, large or small, is faced with the problems of keeping production costs down, quality up. The Reliable Plating Corporation, Chicago, Illinois, uses Wyandotte metal cleaners, to help solve these problems, in a variety of standard job-shop applications. Says President J. Robert Greenwell: "Wyandotte Chemicals have done an excellent job for us for over fifteen years. We consider Wyandotte products the answer to job-shop cleaning problems."

Reliable Plating Corporation uses Wyandotte B.N. and C.S.R. for electrocleaning; Wyandotte W.L.G. for soak cleaning; Wyandotte 321 and Burnek 22 for barrel finishing. In each instance, Reliable reports: excellent cleaning and finishing; increased production through elimination of rejects; savings due to long solution life of chemicals; *definitely lower use-cost!*

Wyandotte B.N. is a superior, versatile electrocleaner for nonferrous, as well as ferrous, metals. C.S.R.* is a unique reverse-current electrocleaner for removing smut from steel. W.L.G.* is outstanding for heavy-duty soak cleaning; removes even toughest soil deposits. Wyandotte 321, a soap-type compound, and versatile, economical Burnek 22 are excellent for ball-burnishing applications.



Soak-cleaning operation at Reliable Plating Corp., Chicago, Illinois, is checked by Vice President Joseph B. Becker (right).

For research-developed and production-proved products that will improve the quality of your cleaning, and reduce operating costs, call your Wyandotte representative, now! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, Calif.*

*REG. U.S. PAT. OFF.

President J. Robert Greenwell, of Reliable Plating Corp., is also president of the National Federation of Metal Finishers; was chairman of the Chicago Electro-Platers Institute for two terms.

Wyandotte
CHEMICALS

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Largest manufacturers of specialized cleaning products for business and industry

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POTTER'S THINNERS ARE EASY TO TEST. Just mix with your lacquer and observe results. If it mixes all right and dries all right ——— it is *all* right.

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The product we make is:_____

We use Lacquer Thinner for:
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We use Lacquer Thinner on:
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We want it to dry:
☐ Fast ☐ Slow ☐ Medium

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Address_____

City_____ Zone____ State_____

ments in the chemical processing, plating and metal working industries, the material is mixed at the job site for immediate application. In most instances where coating membranes are in contact with solvents, exposing the concrete base to attack by acids, Coro-Crete can be used successfully.

Coro-Crete handles like cement topping and is applied in thicknesses from ¼ inch minimum to ⅜ inch maximum (per layer). Coro-Crete cures in a few hours time to a dense, impermeable and non-dusting surface. As it has quick curing qualities, Coro-Crete is especially useful when minimum plant "downtime" is important.

This corrosion-proof material is recommended for existing as well as new concrete floor surfaces. Coro-Crete's adhesion to concrete is excellent and installation data indicates that the bond of Coro-Crete and concrete is stronger than the concrete itself. In addition, Tabor abrasion tests show Coro-Crete to be two to four times more resistant to abrasion than most concrete floors. Its physical strength is approximately four times greater than concrete, the manufacturer states.

For more data circle **14** on Reader Service Card

★ ★ ★

Abrasive Wheel

An abrasive wheel made of neoprene rubber permanently bonded to a cast aluminum wheel under heat and pressure has been announced by C. R. Vogt and Co., Moline, Ill. Called the All-Four Abrasive Wheel, it is designed to perform equally well the four basic abrasive functions of grinding, sanding, polishing, and deburring. A constantly smooth working surface is assured with this wheel and its live rubber base serves as a cushion under the abrasive cloth and prevents slippage. Chipping,

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As nice as they come, for a bright morning on the beach! And R/V products are tops in quality too — varnishes, enamels, lacquers, and special finishes to suit your needs. Let us know . . .

Affiliate: GORDON BARTELS CO., *Roller Coating Specialists*

grooving, and exploding problems are decreased with the All-Four, and a special locking device ends abrasive cloth fly-off. For complete information, write C. R. Vogt and Co., 1528 Third Ave., Moline M41, Illinois.

For more data circle **15** on Reader Service Card

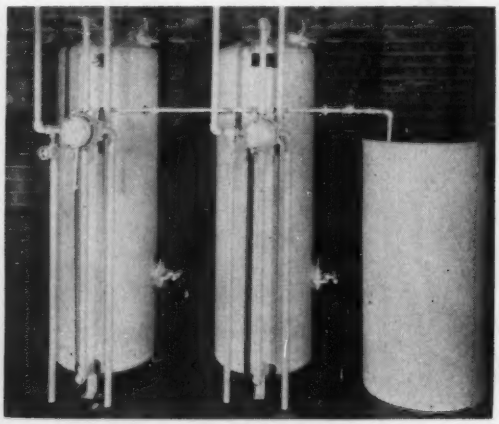
★ ★ ★

Water Softener

Industrial Filter and Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Ill., has announced an improved zeolite water softener. Thirteen standard sizes are available, with flow rates from 6.5 to 40 gallons per minute. These flow rates will satisfy demands for small volumes of soft water.

Of simple design for operation through a single multiport valve, the Industrial zeolite water softener can be supplied with either automatic or semi-automatic controls. In automatic operation, the steps of backwashing, brining, rinsing, and return to service are carried out automatically, without the operator's attention. With semi-automatic operation, the regeneration step is initiated by a push button control.

For more data circle **16** on Reader Service Card



Industrial Zeolite Water Softener

★ ★ ★

Industrial Glove

The Pioneer Rubber Co., Willard, Ohio, has introduced an industrial glove made with flock-lined neoprene. Stanzoil NS-35 features a lining of tiny cotton particles bonded to the inside of the du Pont neoprene glove.

It is stated that the NS-35 has a molded non-slip grip on fingers and palm, giving the wearer a maximum amount of comfort without decreasing finger dexterity. Gloves fit the hand snugly, and give positive protection from chemical and other types of dermatitis. Milled neoprene is said to give excellent resistance to oils, acids, caustics and detergents, and to have excellent tear resistance. 32 styles, weights and sizes of rubber gloves are available from Pioneer Rubber Company.

Flock Lined Industrial Gloves

This industrial glove may be used for chemical mixing operations, polishing and painting operations, and many other purposes.

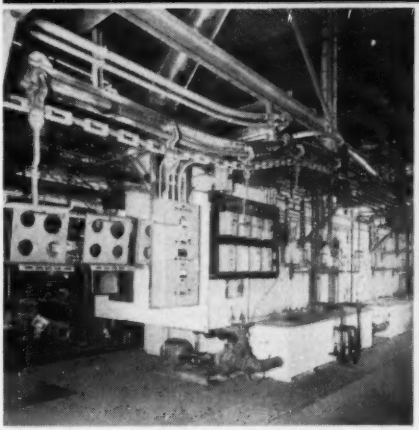
For more data circle **17** on Reader Service Card

★ ★ ★

Attachments for Colorimeter

A series of attachments for use with the Model C "Color Eye" Difference

NOW--LET'S TALK ABOUT *YOUR* "AUTOMATIC FINISHING DEPARTMENT"



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Call KOCH finishing experts now for appraisal of your present set-up and engineering layout. Your only obligation will be your serious consideration of our recommendations.

Get more facts now!

WRITE FOR NEW BULLETIN J-6F TODAY!

GEORGE KOCH SONS, INC.

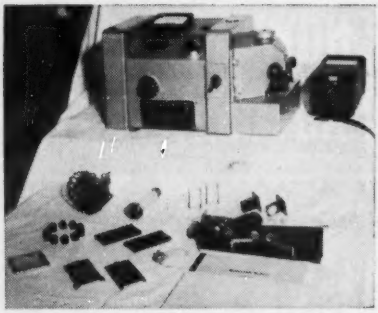
EVANSVILLE, INDIANA

Colorimeter has been announced by Instrument Development Laboratories, Inc., 163 Highland Ave., Needham Heights, Mass.

Ten narrow band interference filters of approximately equidistant visual wave lengths comprise the abridged spectrophotometer, which is used in metamerism studies, formula development, and general laboratory use.

A viewer attachment permits visual inspection of samples as they are presented to the optical system of the "Color Eye," thus simplifying presentation problems with directional reflectance samples, and samples of dark color.

Also available is a pair of natural density filters, which increase the instrument's precision when measuring samples in the low reflectance region relative to stable white reference standards. A series of sample holders has been designed for optimum presentation of samples in the paint, plastics, and textile industries.



Model C Color Eye Difference Colorimeter and attachments.

For more data circle **18** on Reader Service Card

★ ★ ★

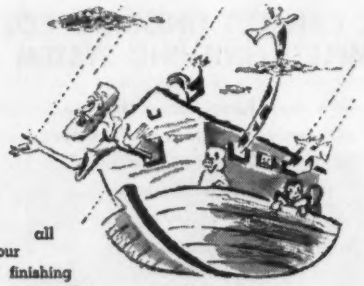
Curing Agent

Shell Chemical Corporation has announced the development of a liquid curing agent, Epon* Curing Agent Z, for use with epoxy resins. This curing agent combines the ease of handling liquid polyamines with the performance properties associated with solid polyamine curing agents.

Development work has shown that Epon 828 systems incorporating Curing Agent Z are particularly useful where excellent chemical resistance, high heat distortion point and good electrical properties under conditions of high moisture are desired.

This liquid curing agent is expected to find wide application as a curing agent for epoxy resins in many applications requiring optimum chemical resistance or improved physical and electrical properties at elevated temperatures. It is a liquid of approximately 2,000 cps. viscosity which can be used at room temperature.

*Reg. Trade Name, Shell Chemical Corp.



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Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog No. 54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. V-7, 3221 Frederick Ave., Baltimore 29, Md.

PITTSBURGH

Power Driven **BRUSHES**

BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Curing Agent Z is available in trial lot quantities from Shell Chemical Corp., 380 Madison Ave., New York 17, New York.

For more data circle **19** on Reader Service Card

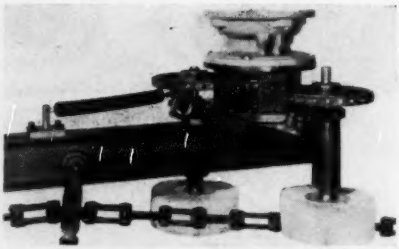
★ ★ ★

Conveyor Chain Brusher

Dust and dirt which sticks to lubricating oil on hard-to-reach overhead conveyor chains can be eliminated automatically without work stopping by a Conveyor Chain Brusher designed and built by the Fuller Brush Company Machine Division. The danger of the spoilage of material in processing from the dropping of accumulated dirt is eliminated by two sets of Fullanchor wheel brushes.

The unit is mounted on the monorail supporting the chain conveyor, and the two brushes, powered by a 1 h.p. motor, pivot on the motor base and bear against the conveyor chain. The brushes can be swung away from the chain for intermittent operation.

Material for the wheel brushes is selected to provide the most efficient brushing action to meet the individual problem, as each machine is "custom engineered" by the Fuller Brush Company Machine Division. Tampico fiber, nylon and crimped steel wire are materials frequently used in these brushes. The fill is driven by a heavy wire staple through a continuous steel channel so that each tuft is held securely, providing strong construction.



Conveyor Chain Brusher

For further information, write to The Fuller Brush Co., Machine Division, Hartford 2, Connecticut.

For more data circle **20** on Reader Service Card

★ ★ ★

Steam Cleaners

The Model K line of Kelite Steam Cleaners has been announced by Kelite Products, Inc. These compact, steam cleaners (gas or oil fired) feature capacities up to 300 g. p. h., with Super Duty models up to 3000 g. p. h. The Kelite Heat Exchanger raises the water temperature to 100 deg. F. before the water enters the main heating circuit.

Another device automatically maintains the strength of the cleaning solu-

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MEANS *PROGRESS* IN RUSTPROOFING

METABOND is the only effective immersion or spray amorphous type zinc coating in the industry today.

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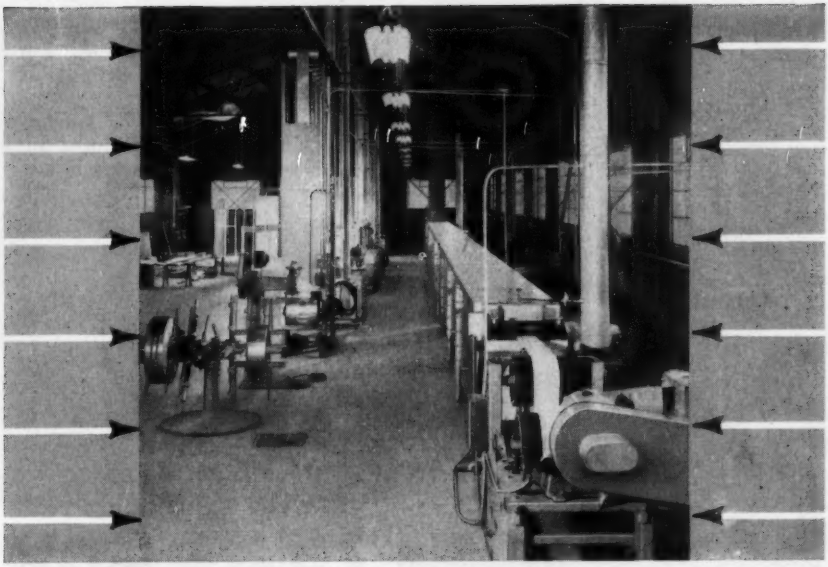
MANUFACTURERS OF RUST PREVENTIVES AND CORROSIVE SOLVENTS



Don't Let Small Space Deprive You of

ROLLACOATING Speed and Economy

Here's one way Gasway engineers adapted continuous ROLLACOATING to restrictive length requirements. By developing a U-shaped unit, they U-tilized available space for double-duty effectiveness. The strip passes through an elevated cross-over, at rear. Feed and rewind are virtually side by side for added convenience of operators.

Don't take it for granted that limited space makes efficient ROLLACOATING out of the question. Vertical installations, multiple parallel lines operating at slower speeds, and other Gasway innovations work wonders in restricted areas.

Engineering initiative, however, is just one "plus" of dealing with the leader, for Gasway ROLLACOATING quickly pays for itself, as well as for building alterations. A continuous unit, as illustrated, can perform every function from cleaning and treating to coating both sides, baking, and re-coiling—all in a single pass. It gives you fastest-of-all paint application without wasting a precious drop. Write for the whole savings story.

Through speedy metal coating, then forming, ROLLACOATING has revolutionized manufacturing methods in industry after industry. We'll be glad to give you full facts on continuous units as well as on individual sheet coaters.

Gasway CORPORATION

6461 N. RAVENSWOOD AVE.
CHICAGO 26, ILLINOIS

Kelite Steam Cleaner

tion at the desired pH. The cabinet requires no clay or firebrick and is louvered for adequate ventilation. All controls are on the front of the cabinet. Further information is available from Kelite Products, Inc., 1250 N. Main St., Los Angeles 12, California.

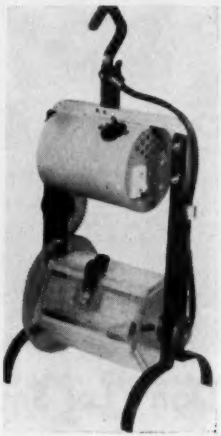
For more data circle 21 on Reader Service Card

★ ★ ★

Midget Plating Barrel

A plating barrel so small that it can be held with one finger has been announced by the Hardwood Line Mfg. Co., Chicago, Ill. Called the "Lazo Minim," this barrel has cylinder dimensions of 4 by 6 inches.

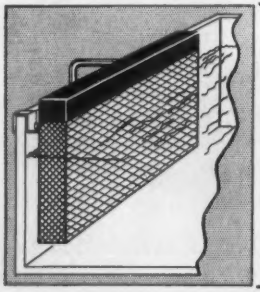
It takes a load about the size of a handful, about 2½ pounds or 1 pint being the capacity. No basket is used.



Lazo Model 1-BM Plating Barrel

The barrel is constructed of plastic, with 1/16 inch perforations, placed extremely close together.

This 4 by 6-inch unit, Model 1-BM, features a single phase gearhead motor of 110 volt, 60 cycle construction. Overall dimensions are 9 by 7 by 17 inches.



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Fast heat up

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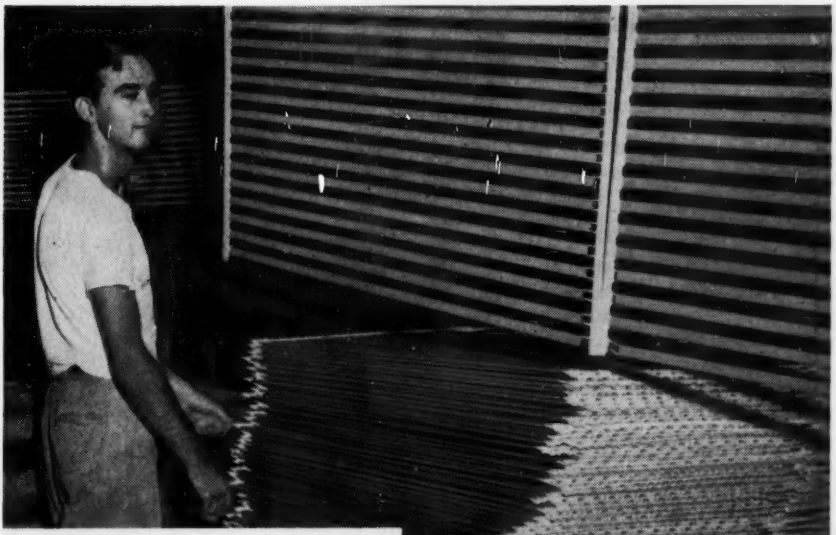


HOT RODS FINISH FASTER with Stanley Lacquer

When the H. L. Judd Division of The Stanley Works wanted to streamline the finishing of their curtain rods and drapery hardware, they asked Stanley Chemical for a coating that would yield them all the advantages of the electrostatic hot spray process. Out of the Stanley experimental laboratory came a new lacquer with just the right flow characteristics. Now the coating on Judd hardware is heavier and smoother without rubbing. Finishing time and costs are down.

Every day Stanley chemists are perfecting new lacquers and synthetics to solve new problems, to improve existing systems for both metal and wood. No problem is too difficult . . . not even yours. Ask us for a recommendation without obligation or write for FREE literature to Stanley Chemical Co., 31 Berlin St., East Berlin, Conn.

STANLEY CHEMICAL

LACQUERS • SYNTHETICS • JAPANS • ENAMELS

Applications for this unit include electronic and jewelry plating as well as job plating of assorted small parts.

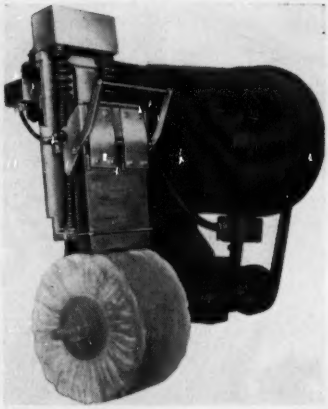
For more data circle **22** on Reader Service Card

★ ★ ★

Buffing Composition Applicator

Packer Machine Co. has announced an improved, completely enclosed buffing composition applicator for bar compounds and rouge which may be applied automatically to buffing wheels.

Model No. 60 is readily adaptable to automatic and semi-automatic equipment, as well as hand jacks. It is designed to hold any length compound bar and will feed 10 inches of compound in one setting. Power is provided by a 1/20 h.p. reducer drive.



Model No. 60 Buffing Compound Applicator

For further information, write Packer Machine Co., Center St., Meriden, Connecticut.

For more data circle **23** on Reader Service Card

★ ★ ★

Filter Felt

A chemical-resistant synthetic filter felt, made of tightly compacted resin-bonded fibers of Dynel, has been announced by Filtration Fabrics Div. of Filtration Engineers, Inc., 155 Oraton St., Newark 4, N. J. Principal applications will be for pressure filters and centrifuges.

Feon Dynel is said to be unaffected by most concentrated mineral acids and bases, and is resistant to a variety of organic acids, bases and salts. The felt is easy to clean, has a structure which retains fine solids, and yet has a relatively high porosity, permitting high filtering rates.

An advantage of Feon Dynel felt, according to Filtration Fabrics Division, is that the bonding resin is Vinyon—the same basic material as Dynel, and will withstand any chemicals for which Dynel itself is suitable.

For more data circle **24** on Reader Service Card

For Platers, Silversmiths, Jewelry Mfgrs., Makers of Watches, Clocks and Electronics and other metal finishers.

Supplied in straight or crimped brass, steel, nickel silver or stainless steel wire in sizes .0025 to .006 and in bristle, fibre or Nylon. Special sizes and shapes to order.

Write (Dep't. P) on your letterhead for catalog and price list.

DIXON & RIPPEL, INC. KINGSTON, N. Y.
ESTABLISHED 1856

Rust Preventive Coatings

Rust preventive fluids for coating metal parts before storage that can be burned cleanly from metal surfaces after storage have been announced. These coating fluids, marketed under the brand name Ucon, do not leave residues after burning to interfere with painting, welding, soldering, brazing, or annealing. They can be removed with solvents or, in some cases, by mild scouring with water. Ucon coating fluids are products of Carbide and Carbon Chemicals Company and are available in several viscosity grades. They have negligible solvent or swelling effects on various types of rubber, the manufacturer states.

Ucon coating fluids can be used diluted or undiluted, or a higher viscosity grade can be diluted with solvents to the proper viscosity. Choice of method depends on the thickness of the residual film necessary to provide complete protection on the particular metal, facilities in the storage area for accommodating solvent vapors, and the economics of using solvents as diluents.

Technical information is available from Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd St., New York 17, N. Y.

For more data circle **49** on Reader Service Card

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For further information on any product mentioned in this issue—use the READER SERVICE CARD inside back cover.

Stop dust quickly, at lower cost, with Dustkop. Thirty-seven standard models *ready to use* and available from stock. Dustkop conserves floor space, reduces maintenance. Collects almost all types of industrial dusts. Write for descriptive literature.

Also a complete line of Mist Collectors

AGET MANUFACTURING COMPANY
1390 East Church St. • Adrian, Michigan

Buffing Compositions

Globe Compound Co., Inc., Waterbury 12, Connecticut, has announced the development of a special line of buffing compositions for the finishing of stainless steel. These compositions are available in both liquid and bar form for automatic or hand applicators.

For more data circle **25** on Reader Service Card

★ ★ ★

Steam-Hot Water Generator

A boiler has been designed for industrial use by the Cyclotherm Div., U. S. Radiator Corp., Oswego 1, N. Y. The unit is basically a hot-water generator, but a few adjustments convert it to steam operation quickly. Both the steam and hot-water phases operate automatically once the proper type of operation is selected. The combination steam-hot-water generator is designed for use in plants heated by hot water that have an occasional use for steam (such as steaming out tanks, degreasing and limited processing).

The unit operates on light oil, gas or a combination of light oil and gas. It is rated as a 60 h.p. steam or hot water generator.

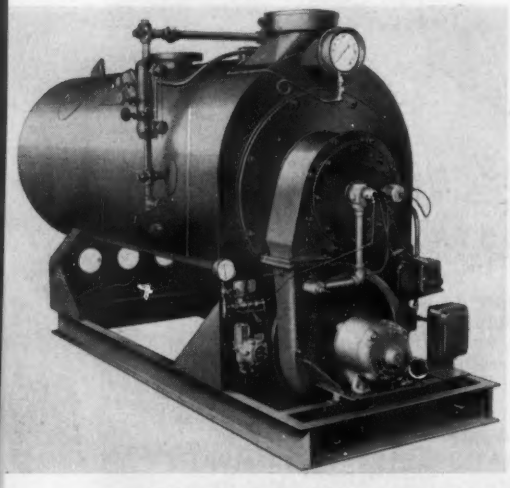
For more data circle **26** on Reader Service Card

★ ★ ★

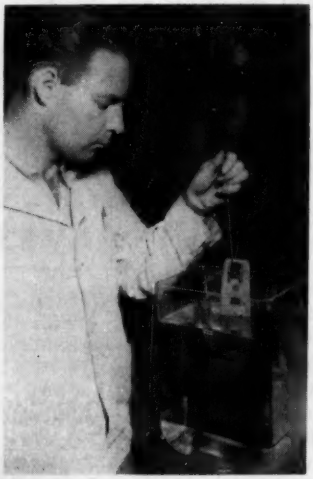
Protective Film

Fidelity Chemical Products Corp., 470 Frelinghuysen Ave., Newark, N. J., has announced the availability of Laqua, a coating for metals that preserves chemically cleaned surfaces obtained directly after electroplating or a chemical cleaning operation. Laqua can be sprayed on a clean surface or be applied as a dip after a final water rinse, without drying. This is possible because Laqua displaces water as it deposits a thin protective film.

It is ideally suited for application in the metal products, sheet metal and automotive industries. When this mate-



Combination Steam-Hot Water Generator



Part being dip coated with Laqua protective film

rial is applied, metals that tend to discolor by oxidation, contact with sulfur fumes and humidity, are kept in a bright, clean condition, free from finger prints. Laqua also offers salt spray resistance. After 210 hours of an A.S.T.M. salt spray test, no corrosion was found on parts so coated.

"Fungus" type growth is practically eliminated when Laqua is applied on cadmium parts which come in contact with plastics and insulation. The drying operation after plating is also eliminated. Plates are dipped immediately after a final hot water rinse.

Soldering operations are speeded, and coated cadmium plated and aluminum parts can be spot welded without harming the normal strength of the weld, it is stated.

Laqua coated parts can be recoated with practically all organic finishes and can be either air dried or baked. Parts can be stripped of Laqua with any strong alkaline cleaner.

Additional data and samples can be obtained by writing to Fidelity Chemical Products Corp., 470 Frelinghuysen Ave., Newark, New Jersey.

For more data circle **27** on Reader Service Card

★ ★ ★

Plastic Fan

A plastic fan made of either of two types of plastic, Rigivin, a rigid vinyl, high impact type, or Rigidon, a glass fiber reinforced plastic, have been announced by the Heil Process Equipment Corp., 12901 Elmwood Ave.,

a FULLER BRUSH product

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Handy Fuller Slide Chart of Wheel Brush Specifications

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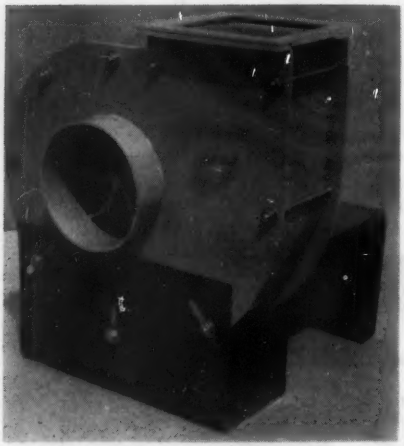


Fan, designed for use in removing corrosive fumes, has solid plastic construction.

Cleveland 11, Ohio. These fans are designed to handle fume removal under severely corrosive conditions. The solid Rigivin fans are designed for use with strong acid or alkali fumes where maximum corrosion resistance is required. Rigidon fans are recommended for most acid services and high temperature applications to 200 deg. F. The smooth interior surfaces inherent with either material increase the fan's efficiency and limit build up of solids carried by the fumes. The solid plastic construction affords complete exterior as well as interior corrosion resistance. High efficiency, quiet operation, and non-overloading characteristics are design features incorporated into these units, the manufacturer states.

These fans are available with variable discharge positions for either plain or flanged inlet and outlet connections.

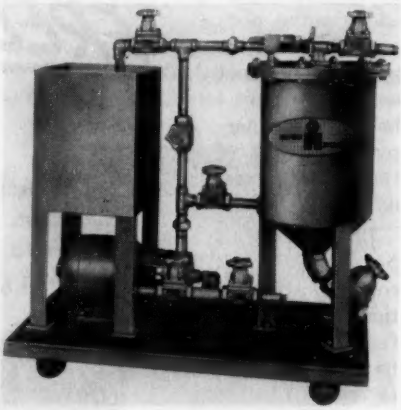
For additional information contact Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio.

For more data circle **28** on Reader Service Card

★ ★ ★

Plating Solution Filter

Designed to remove sludge formed by dissolving electrodes and prevent dust, dirt and oil contamination of metal parts during plating operations, a Hoffman-Hygrade self-cleaning pressure filter has been developed by the United States Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.



Plating Solution Filter

The filter uses a stainless steel wire-

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Formula No. 5

Trial pound $2.50

Bulletin on Request

Ideal for rack coating repair. Also good for nuts, bolts, threaded holes and cavities — gears.

ACID RESISTANT

Does not harden or dry out.

ANDERSON'S PLASTICS CO.

Box 416, Natick, Mass.

wound cylinder which supports the filter media, is corrosion resistant and helps to speed the filtration process.

The filter's outstanding features are: a backwashing device which accomplishes filter cleaning by turning two valves; filtration at high pressure (up to 125 p.s.i.) tank capacities up to 5000 gallons, and a long filtration cycle.

The Hoffman Hygrade filter requires no filter bags, sheets or pads. Carbon treating and filtering are performed in one operation. Filter aids are wood pulp, diatomaceous earth and carbon.

Compactly designed, the complete assembly consists of pre-coating tank, splash proof electric motor, pump, filter pressure chamber, valves for suction and discharge flow and a pressure gage. The complete assembly can be mounted on one base and transported to filtration areas anywhere within the plant.

The filter is intended for use on bright nickel, acid copper, copper cyanide, zinc, zinc cyanide, cadmium, gray nickel, chrome plating, pickling, gold and silver cyanide, high speed copper, indium, sodium stannate, halogen tin, sulfamate lead, gold hydrate, and silver strike solutions.

For more data circle **29** on Reader Service Card

★ ★ ★

Ultrasonic Pickling, Descaling and Electroplating

Two industrial processes using ultrasonic vibrations in liquids have been announced by The General Ultrasonics Co., Hartford, Connecticut.

The Sonistrip Process is used to accelerate and improve the efficiency of pickling and descaling of metals in acids and caustics. Welded stainless steel Sonicells, impervious to most corrosive fluids, are immersed in acid or caustic solutions and radiate ultrasonic vibrations at 19,800 cycles per second. This accelerates the pickling and cleanup effects of the solutions. Rust, oxide and scale removal are accomplished more quickly. Interior surfaces and deep crevices are pickled or descaled in the same time as the outer surfaces, it is stated.

The Soniplate Process is used in electroplating and electroless plating to introduce ultrasonic vibrations into the plating bath. If required, the stainless steel Sonicells can be further protected by resin coating. The vibrations and accompanying "cavitation" cause rapid replacement of the exhausted or saturated liquid layers ordinarily surrounding anode and cathode, and increases in plating current density without "burning" have been noted. Edge build up is minimized, throwing power is increased, and anode polarization is eliminated, it is stated. Grease, rust or dirt which may have remained on the work due to imperfect precleaning are simultaneously removed by ultrasonic action.

The key to these pickling, descaling and plating processes is the line of stainless steel, hermetically sealed Sonicells which can be immersed in corrosive or conductive liquids. These Sonicells are installed one to each square foot of tank side or bottom area and can be arranged as necessary.

For small scale production they are powered by electronic generators.

For more data circle **54** on Reader Service Card

★ ★ ★

Nickel Salts

Federated Metals Division, American Smelting and Refining Company, has announced the availability of improved quality nickel salts for nickel plating. These salts complement the

full line of plating anodes that Federated Metals currently furnishes. The crude salts are a by-product of electrolytic copper refining at plants of the American Smelting and Refining Company. As a result of better crude and consistent quality control during manufacture, these nickel salts contain full nickel content, the company states .

For more data circle **30** on Reader Service Crad

★ ★ ★

Sump Filter Pump

The Sethco Sump Filter Pump, for filtering expensive solutions, such as silver, gold, rhodium, and palladium, has been announced by the Sethco Manufacturing Co., Brooklyn 1, N. Y. It consists of a sump pump, a tank, and a filter assembly. The sump pump is mounted in the tank and is completely insulated from it. The filter is connected to the pump through an opening in the side of the tank.

The sump pump is self priming and, inasmuch as it is immersed in the liquid being processed, there can be no loss of liquid. The tank size can be varied to meet any application, and can be used as a sump catching the overflow from a larger tank, or as the plating tank itself. The equipment is versatile in that the sump pump can be placed into an existing plating tank with connection being made to the filter assembly directly through the tank or over the tank.

Sump Filter Pump

The sump pump is available fabricated of plastic or stainless steel. The tank is made of plastic, stainless steel, or rubber lined steel, and the filter assembly of high temperature transparent plastic, rigid vinyl, polyethylene, epoxy, Teflon, Saran, Haveg, stainless steel, or rubber lined steel. Thus almost unlimited application is possible, although the setup is particularly advantageous in filtering expensive solutions, where loss of liquid might be economically disastrous.

For more data circle **31** on Reader Service Card

PAINT MIXER
MIRACLE PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIXERS AVAILABLE
¼ PT. to 55 GALS.
MIRACLE PAINT REJUVENATOR COMPANY
127 E. 9th St., St. Paul 1, Minn.
5 GAL. MODEL

★ ★ ★

Overhead Conveyor

An improved Chainveyor Conveyor System has been announced by the Chainveyor Corp., 5618 E. Washington Blvd., Los Angeles 22, Calif. All turns

in the system are executed with 16-inch radius, heat treated fabricated curves. Any combination of turns, including those from 90 degree vertical to 10 degree horizontal are possible by joining horizontal curves with vertical top and bottom curves.

The track for this conveyor is 1⅝ inch cold-formed, open-seamed tubing that weighs only 2 pounds per foot. A 3/16 inch slot is the only opening, thus dirt and abrasive infiltration are cut to a minimum. Load pendants on 6 inch centers extend through the 3/16 inch slot.

The load capacity is rated at 60 pounds per foot. However, loads up to 120 pounds can be carried by means of crossbar supports connecting multiple pendants.

Employing a 6 inch pitch chain with ball bearing, solid steel wheels, the Chainveyor has a low coefficient of friction. The overall assembled tensile strength of more than 3,000 pounds is obtained by using parts all made from heat treated steel.

Varying capacities of 200, 400, and 600 pounds chain pull are available in four types of power drives, one of which will meet any special requirement.

Drives can all be furnished with variable speeds ranging from 6 inches to 60 feet per minute. A constant pull is assured by positive sprocket tooth contact, which distributes chain stresses over a minimum number of teeth.

The Chainveyor Take-up, a one piece spring loaded assembly 33 inches wide overall, automatically maintains uniform chain tension to compensate

5068-CC

If you have a corrosion problem . . . SEE CEILCOTE FIRST! Here's a 4-page multi-colored illustrated catalog that presents comprehensive information on a complete line of corrosion-proof linings, bricks, bonding cements, protective coatings and mastic floors.

Twenty-seven of Ceilcote's corrosion-proofing materials are charted, showing their resistance to 19 of the most common chemicals which contribute to corrosive conditions in all types of industries.

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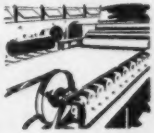
CORROSION PROOF MATERIAL AND CONSTRUCTION

4848 RIDGE ROAD, CLEVELAND 9, OHIO

Metal Working

Chemical and Oil Refining



Pulp Paper and Textile

for linear expansion and contraction due to load and temperature changes.

For more data circle 32 on Reader Service Card

★ ★ ★

Mechanical Finishing Machine

Development of a semi-automatic mechanical finishing machine for finishing a wide variety of parts in a relatively short time cycle has been announced by Roto-Finish Co., Kalamazoo, Michigan.

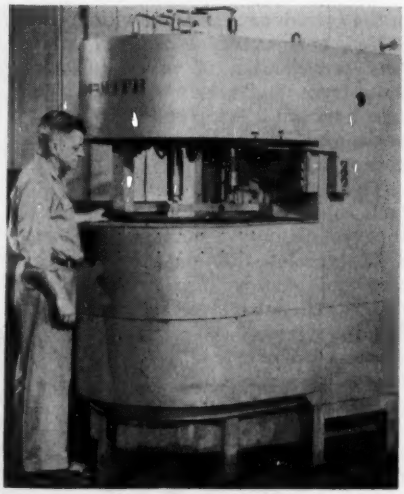
Called the "Roto-Mite," the machine is designed primarily for small lot production or experimental work.

It is designed with a removable tub in which finishing mass is contained and rotated. This feature allows use of several tubs with different type masses. Tubs can be changed quickly to allow changeover from one operation to another. Each tub is complete with built-in sludge removal system.

Removal of the tub does not require modification or adjustment of the driving mechanism, as the drive is a separate unit on which the tub is mounted.

The Roto-Mite also features variable speed drive, which further increases its versatility.

Other features of the tub include: locating and locking devices; an arrangement for continuous sludge removal through the bottom; and a collector ring which has pipe fittings to allow connection to a recirculating tank or drain.



Roto-Mite Semi-Automatic Mechanical Finishing Machine. Designed primarily for small lot production or experimental work, the machine uses either wet or dry abrasive masses.

The main drive is a 5 h.p. U. S. Varidrive, vertically mounted in the rear of the machine, and the power unit is belt-connected to the tub drive assembly. A remote speed control allows selection of processing speeds from 100 to 500 feet per minute.

In operation, the parts are held in fixtures attached to lower ends of vertically mounted spindles, which are mounted above the mass. Spindles lower to submerge parts in the rotating processing mass. As the spindle submerges the part into the mass, it rotates, thus all sides of the part are exposed to the mass to ensure uniform finishing.

The Roto-Mite has four spindles and is available with three different spindle arrangements, the company reported.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
301 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.
Send data on Engineering & Construction facilities for
ACID-ALKALI-PROOF CONSTRUCTION
of processing & storage tanks & flooring in
☐ Steel Plant ☐ Chemical ☐ Textile ☐ Food
NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Spindles are complete with manual flushing, and manual controlled air-operated fixture locking and unlocking. Rotation of the spindles stops automatically when spindles are raised from the mass.

Optional equipment offered includes a totally enclosed Varidrive and a processing solution collection tank with recirculating pump, overflow, and sludge collection sump. The tank allows the reuse of processing solution.

The Roto-Mite uses wet or dry masses and a wide range of abrasive materials and steel balls.

For more data circle **33** on Reader Service Card

★ ★ ★

Precolored Aluminum

Coil and sheet aluminum produced by an electro-chemical process of recent invention has been announced by the Aluma Kraft Manufacturing Company, 1330 North Rock Hill Rd., St. Louis, the sole licensee for the process.

Called the "Spectromatic" process, the method is said to produce colors in a large range of hue, value and chroma that are opaque and glossy. The finish has good resistance to weathering and abrasion. In a Weatherometer test, in which samples are constantly exposed to cycles of 17 minutes of ultra-violet rays and 3 minutes of water spray, the colors have shown no apparent fading after long exposure.

The process has the advantage of being able to produce colors which are identical in every cycle of manufacture, even if the cycles are separated by long periods of time. The colors will not chip, craze, or peel, it is stated.

Aluminum treated by the Spectromatic process retains its original characteristics, such as flexibility, but acquires greater hardness, heat resistance, and electrical resistance on the surface.

The finish produced by this process is flexible enough to allow articles to be roll formed or shallow drawn without marring the surface, the manufacturer states.

Uses for the product include interior and exterior architectural applications, automotive trim and appliance trim.

For more data circle **34** on Reader Service Card

★ ★ ★

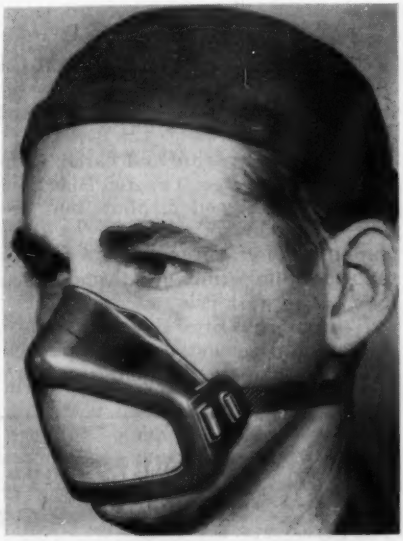
Paint Mask

The "Flex-A-Prene" Paint Mask, developed by Flexo Products, Inc., Cleveland, Ohio, provides protection for spray paint operators. It keeps out paint pigment and solvents and is comfortable to wear. The mask weighs only one ounce and can be worn with goggles or spectacles.

A filter material, "Prenex," which is not affected by paint pigments or solvents is used to remove foreign particles from the air.

Further information can be obtained from Flexo Products, Inc., Cleveland 13, Ohio.

For more data circle **35** on Reader Service Card



Flex-A-Prene Paint Mask

Bronze Plating Bath

The good color, corrosion resistance and hardness of electroplated bronzes, especially those composed of 80-95 per cent copper, and the balance tin, have made them useful for a variety of applications. A pyrophosphate bronze plating bath, developed at the Battelle Memorial Institute, permits rapid deposition of an alloy uniform in composition with an easily buffed plate, and has good throwing power. The process has given good results commercially in both barrel and tank plating.

Applications include the bronze plating of steel glass-to-metal seals for refrigerators and appliances, zinc die castings as a base for chromium plating, steel base bearings, cast-iron caps and housings, steel pintles of bronze door hinges, and brass hardware.

For more data circle **36** on Reader Service Card

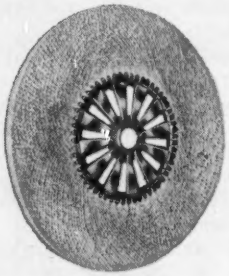
★ ★ ★

Bias Sisal Buff

A Tapered Bias Sisal Buff that lies flat and eliminates streaking is now being marketed by the American Buff Co., Chicago, Ill.

Narrow at the core and flared at the outer working face, Tapered Bias Sisal Buffs are designed to allow buff sections to fit together closely without gapping. This construction results in improved uniformity and smoothness of coloring work it is stated.

Tapered Bias Sisal Buffs are made of top-grade bias cut sisal. Fibers are locked together by the "Permanizing" process, to eliminate loose ends and resultant scratching. The design assures circulation of air throughout the fibers for cool running in both cutting and coloring operations.



Tapered Bias Sisal Buff

For complete information, write to the American Buff Co., 2414 South LaSalle St., Chicago 16, Illinois.

For more data circle **37** on Reader Service Card

★ ★ ★

Teflon Coatings

Teflon* coatings for bonding directly to metals have been announced by the Electro Chemical Engineering & Mfg. Co., Emmaus, Pa. Teflon dispersion coatings may be bonded to any metal having a melting point over 750 deg. F., except copper, by means of special primers and processes developed by E. I. du Pont de Nemours & Co., Inc. The primer and finish coats are fused at a temperature of approximately 700 deg. F. after spray application.

Although Teflon itself is unaffected

*Reg. Trade Name, E. I. duPont de Nemours & Co.

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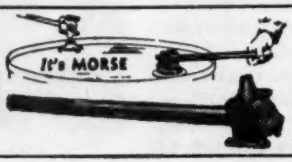
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



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SATISFACTION GUARANTEED.... $3.30
Non-sparking type $5.10
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762 W. Manlius St., E. Syracuse, N. Y.

by practically all common chemicals at temperatures up to 500 deg. F., the coatings are not recommended for protecting metals against the attack of severely corrosive chemicals, since the coatings have a certain inherent film porosity which cannot be overcome by multiple coats. The fact that Teflon is chemically inert, however, broadens the applications for these coatings.

The variety and number of applications where Teflon coatings have proved successful cover the fields of food, chemical, plastic, rubber and other industries. Teflon coatings are particularly useful in coating surfaces which are exposed to materials which are sticky or tend to leave scale and deposits.

Further information is available from Electro Chemical Engineering & Mfg. Co., 750 Broad St., Emmaus, Pa.

For more data circle **38** on Reader Service Card

★ ★ ★

Plating Solution Analyzer

Beckman Instruments, Inc., Fullerton 1, Calif., has announced the Beckman DU Spectrophotometer, which may be used to measure the concentration of brightener in plating solutions. The amount of brightener must be controlled carefully for optimum results. This method provides a safe, effective, quick way to accomplish this, the manufacturer states.

The method employed is described in Data Sheet 27, available from Beckman Instruments, Inc., Fullerton 1, California.

For more data circle **39** on Reader Service Card

★ ★ ★

Plastisol Coating

Dennis Chemical Company has introduced a series of Denflex Plastisol Metal Coatings, which include a one-coat primer which tightly bonds the plastisols to metal surfaces such as steel, copper, brass, aluminum or galvanized iron. The primer, Denflex No. 2386, may be applied by brushing, dipping, roller coating or spraying. After an air dry of 15 to 20 minutes on most surfaces, the plastisol finish may be applied and baked. A spray or dip application can be used to produce a decorative coating or a hard finish of substantial thickness. Gloss and color can be supplied as desired.

Suggested uses are for tool handles, tank linings, outdoor furniture, and air conditioner cabinets. Complete information is available from Dennis Chemical Company, 2701 Papin Street, St. Louis 3, Missouri.

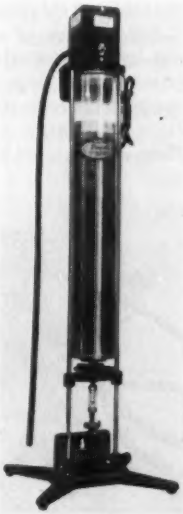
For more data circle **40** on Reader Service Card

★ ★ ★

Demineralizer

A dual-type demineralizing unit, designated as Model R-M-8, has been announced by the Penfield Manufacturing Co., Inc., Meriden, Conn. This mono-column demineralizer can be used with a single bed of mixed cation and anion resins, or as a two bed system with separate cation and anion resin beds in the single column.

With either system, the unit produces up to 10 g.p.h. of demineralized water with as little as 10 grains sodium chloride (expressed as $CaCO_3$). If desired, the unit is capable of remov-



Model R-M-8 Demineralizer.

ing silica and CO_2 through the use of special resins. Regeneration is simple and fast, it is stated.

Complete information may be secured by writing Edward H. Clohessy, general manager, Penfield Manufacturing Co., Inc., 19 High School Ave., Meriden, Connecticut.

For more data circle **41** on Reader Service Card

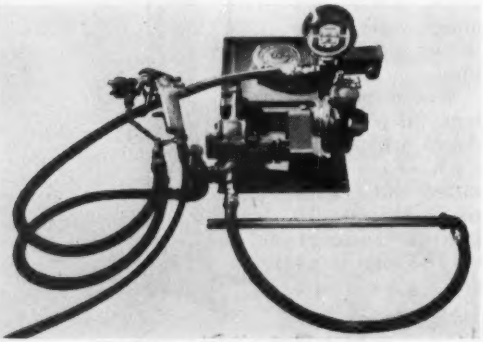
★ ★ ★

Circulating Paint Heater

An improved circulating paint heater is being manufactured by the Bede Products Division of the U. S. Automatic Corp. Two models are available, Model E, and Model EE, both being electrically heated. Both models provide constant circulation, an advantage when spray application is intermittent or irregular. Adjustable temperature and fluid pressure controls afford uniform performance with all paints and solvents.

Advantages of paint heaters pointed out by the manufacturer are: reduced paint losses; less solvent waste; fewer coats required; and less orange peel, runs, and sags.

For more data circle **42** on Reader Service Card



Bede Model EE Paint Heater

Polishing Wheel

A Sawco polishing wheel that permits high speed polishing with an extra margin of safety has been announced by Sandusky Abrasive Wheel Co.

Several models are available, including four types of rubber bonded wheels to meet a wide range of polishing jobs. Leader in the line is the Sawco PRH Wheel which is a dense, long life wheel for polishing and removing tool marks in hard steels and alloys. Other wheels include the Stan-Pol for general polishing and de-burring, the Qik-Pol for extra fast polishing and the Hi-Pol, a

Sawco Polishing Wheel

wheel especially designed for precision polishing and cleaning.

Because of the high strength rubber bond, Sawco polishing wheels may be operated at higher speeds common to many bench and portable grinders, while maintaining a wide margin of safety. For example, a 6 inch PRH Wheel is rated for 6000 r.p.m. operation. This feature permits faster polishing without endangering workers, the manufacturer states.

All Sawco Polishing Wheels are self-dressing and non-loading. They may be shaped for polishing irregular surfaces and contours. The Sawco line also includes custom-made rubber-bonded and resin-reinforced, rubber-

bonded grinding and cut-off wheels, abrasive sticks and blocks, and small mounted wheels. For full information, write Sandusky Abrasive Wheel Co., 4004 Park, Sycamore, Illinois.

For more data circle **43** on Reader Service Card

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Chemical Resistant Coatings

The Corrosion Control Co., Inc., has announced a line of chemical resistant coatings and linings for use in plant maintenance. Called Neocor C-10 and Neocor HD series, they are neoprene based, and offer protection against many reagents over a wide temperature range, the manufacturer states. Both series cure at room temperature.

Neocor C-10 is a one package, room temperature curing coating which may be applied by spray or brush, and is resistant to chemicals within the range of minus 20 to 275 deg. F. These materials are resistant to sunlight and weathering, and cure to tough, abrasion resistant films. The coatings dry quickly, and offer good resistance to salts, alkalies, and all acids except concentrated oxidizing acids.

Neocor HD is a two package room temperature curing chemical resistant lining, designed for immersion service over a wide temperature range. It may be applied by spraying or dipping, and is effective in the temperature range of minus 65 to 300 deg. F. Thick coatings are possible with this material.

Both coatings are recommended for protection of process equipment, tanks, and structural steel.

For more data circle **44** on Reader Service Card

★ ★ ★

Degreasing Solvent

Octagon Process Inc., has developed a degreasing solvent, "Klearall 95," which will remove light oils from metal parts readily.

Klearall 95 is used cold, evaporates rapidly from parts and can be redistilled. It has no objectionable odor, is non-explosive and does not support combustion.

Klearall 95 is used in a mild steel tank for immersion degreasing and has been particularly successful when cleaning prior to painting is required on such items as cabinets, steel shelving, metal furniture, lighting fixtures, radio parts, doors and fans.

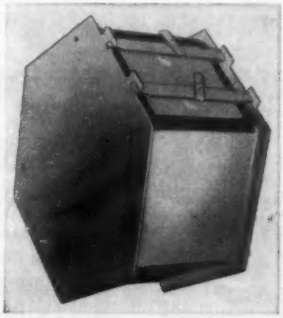
Copy of fact sheet is available from Octagon Process Inc., 15 Bank Street, Staten Island 1, New York.

For more data circle **45** on Reader Service Card

★ ★ ★

Separate Tumbling Barrel

For the use of manufacturers who wish to rebuild or remodel existing tumbling and burring machines, or build a machine of their own design, Rampe Manufacturing Co., Cleveland, Ohio, has placed on the market a separate tumbling and burring barrel. At the present time, four sizes and styles of this equipment are available: a hexagonal, conical, open and tumbling barrel of 7½ gallon volume, 16 inches high, of welded, water-tight construction; and three sizes of closed hexagon-



Rampe Separate Burring Barrel

al steel burring barrels: 5 gallon, 1.1 cubic feet, and 2 cubic feet volume, respectively. Perforated sheet metal doors for draining liquids are available for each of these models.

All barrels may be furnished with vinyl plastic coating, if desired, and can be relined at any time.

Complete information and specifications may be obtained from Rampe Mfg. Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

For more data circle **46** on Reader Service Card

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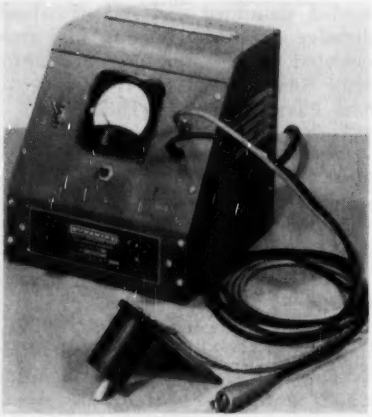


Anodized Aluminum Tester

Anodized Aluminum Tester

Sunshine Scientific Instrument, 1810 Grant Ave., Philadelphia 15, Pa., has announced the development of an anodized aluminum tester to determine the effectiveness with which an anodized coating has been applied to an aluminum surface.

This non-destructive, portable instrument is designed to test chromic and sulfuric acid type coatings. It operates on the principle that the 60-cycle breakdown voltage is proportional to the coating type and thickness. It is supplied with three ranges: the 0-20 volt range for chromic acid type coatings; and the 0 to 100 and 0 to 600 volt range for sulfuric acid type coatings. The tester is also useful for measuring other coatings where the voltage breakdown principle can be applied.

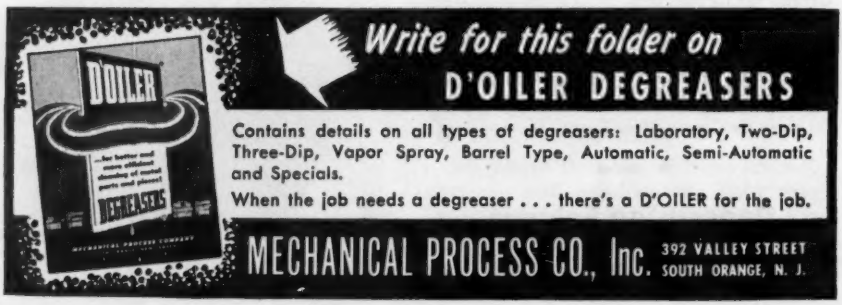
For more data circle **47** on Reader Service Card

★ ★ ★

Buffing Compound

A buffing compound specially formulated to produce deep color on stainless steel cutlery has been announced by Russell H. Burns Compound Co., 810 Lincoln Blvd., Middlesex, N. J.

The compound, called "Steelhue," is made from calcined aluminous oxide with a binder of animal fatty acids. Ac-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DEGREASERS
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D'OILER DEGREASERS
Contains details on all types of degreasers: Laboratory, Two-Dip, Three-Dip, Vapor Spray, Barrel Type, Automatic, Semi-Automatic and Specials.
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MECHANICAL PROCESS CO., Inc.
392 VALLEY STREET
SOUTH ORANGE, N. J.

cording to the manufacturer, it is completely free from iron contamination.

"Steelhue" is available in special sizes for use in automatic buffing machines.

For more data circle **48** on Reader Service Card

NEW BOOKS

Protective Coatings for Metals by R. M. Burns and W. W. Bradley. Second edition. ACS Monograph Series No. 129. 643 pages. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. Price, $12.00.

This book contains information on the composition, properties and performance of both metallic and organic coatings. Sections are included on the evaluation of organic coatings, corrosion inhibitors, chemical conversion coatings, and sprayed metal coatings. Full explanations of such phenomena as "silver migration" and "metallic whiskers" are given. Current practices in metal cleaning, coating application, and testing are discussed. Many literature and patent references are included.

★ ★ ★

1955 Year Book of the Federation of Paint and Varnish Production Clubs. Published by the Federation of Paint and Varnish Production Clubs, 121 S. Broad St., Philadelphia 7, Pa. 160 pages. Price, $1.50.

Inside the covers of this yearbook the reader will find a complete roster of the Federation's 24 constituent clubs; an alphabetical list of the 3,460 members who represent the production and technological departments of more than 1,200 companies engaged in the manufacture of protective and decorative coatings; a list of officers, council members, and committees for 1954-55; and the constitution, bylaws, and duties of the various Federation committees.

★ ★ ★

Aluminum Paint and Powder — by Junius D. Edwards and Robert I. Wray. Third Edition. Published by the Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. Price, $4.50.

In this book the manufacture, properties and testing of aluminum powder are fully described, with emphasis on the processes involved, color, brilliance, leafing, density, grading and handling. Full chapters discuss the composition, properties and uses of aluminum paint in a wide variety of applications.

Also included in the book is a section on uses of aluminum powder in the arts. Applications of aluminum in printing inks, metallized paper, coated textiles, powder metallurgy, plastics, and many other fields, are presented.

★ ★ ★

BUFF CATALOG. Several new types of automatic buffs designed to meet special needs of buff users are featured in the 12-page catalog now being distributed by American Buff Company, Chicago.

Featured are: the extra-flexible Unit Sisal Buff for fast cutting on irregular or contoured surfaces; and the new "Open" Bias Sisal type, reported to be the coolest-running buff ever made; as well as the full line of Bias Cloth, Bias Sisal, and conventional Sisal buffs. The catalog also illustrates and describes the company's exclusive, patented "Centerless" construction and air-cooled Permanent Centers, available in steel or fiberboard.

Buff users can obtain a copy of this informative catalog by writing to **American Buff Company**, 2414 S. La Salle St., Chicago 16, Illinois.

★ ★ ★

Sixteenth Porcelain Enamel Shop Practice Forum Proceedings. Volume 16. 193 pages. Published by the Porcelain Enamel Institute, 1145 Nineteenth St., N. W., Washington 6, D. C. Price, $5.00.

Like the Forum itself, the publication of the proceedings is an annual event.

The Forum's first session was devoted to thirteen concise reports on latest industry developments. The reports, comprising 53 pages in the book, summarize the progress and status of topics of current interest to the industry. Processing methods in the enameling industry are treated in the next section of the book. "Guide Posts in the Enameling of Hot Water Tanks" and "Fundamentals of Metal Cleaning" are two outstanding papers from this session.

The growing importance of color is covered in papers by six experts from the industry in a symposium entitled, "Color From the Shopman's View-Point." The final chapters of the Forum Proceedings include reports on practical tests for enamelers and on one coat application processes.

NEWS of the Industry

NEW PLANTS

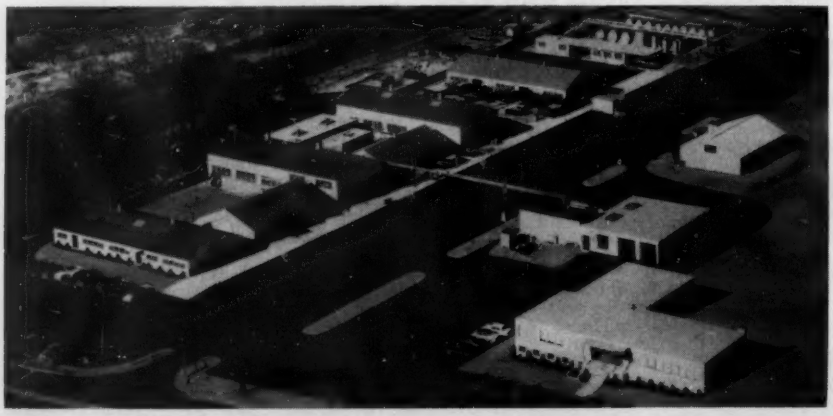
The new plant of **RAFFI & SWANSON, INC.**, manufacturer of finishes, has been dedicated in an "open house" observance to which leaders of many industries were invited.

Occupying more than 15 acres, the 14-building layout is located in Wilmington, Mass.

The plant buildings are laid out along a 500 feet long, 20 feet wide loading platform. For safety, manufacturing departments are housed in separate buildings. All buildings are of fireproof construction and protected by sprink'er systems. Mixers and mills are protected with automatic CO_2 blanketing extinguishers. Floors are of special non-sparking composition. All equipment is electrically grounded. Electrical equipment is explosion proof. Provisions made for machine guards, stairways, runways, material handling, machine placement, ventilation, lighting, and layout are all designed with regard to health and accident hazards.

★ ★ ★

PHELPS DODGE REFINING CORPORATION, New York, has opened a



New Plant of Raffi & Swanson, Wilmington, Mass.

warehouse in Chicago where stocks of Triangle Brand copper sulphate and nickel sulphate will be available. This will be Phelps Dodge's third shipping point, the other two being El Paso, Texas and Laurel Hill, Long Island.

The address of the new warehouse is 5310 West Sixty-Sixth St., Chicago 38, Ill. The Chicago sales office of the company has been moved from 230 North Michigan Blvd. to the new warehouse.

★ ★ ★

New products and processes developed through research were highlighted at the dedication of the **MINNESOTA MINING & MANUFACTURING CO.** Research Center.

The dedication program was held in the Central Research Laboratory building, first unit to be completed at the Center. An electrical products laboratory building also is nearing completion.

Featured at the dedication was the world's first cross country transmission of color television on magnetic video recording tape. This 3M tape, developed by the Central Research group, records the audio and video portions of the TV signal and reproduces sound and pictures immediately on playback.

The dedication ceremonies honored William L. McKnight, 3M board chairman; Archibald G. Bush, chairman of the executive committee; and the late Richard P. Carlton, former president of the company, as the three men who contributed most to the company's growth through their fostering of research and product development.

The company had only one product, sandpaper, during its first quarter century. Since that time it has added magnetic tape, "Scotch" Brand cellophane tape along with more than 200 varieties of pressure-sensitive tapes, roofing granules, reflective sheeting for safety and advertising uses, a full line of electrical insulating products, a line of adhesives and coatings, a new series of fluorochemicals with unusual physical and chemical properties, a number of graphic arts products, office duplicating equipment and others.

COMPANIES

The establishment of the **BEDE INTERNATIONAL DEVELOPMENT CO.**, 14237 Detroit Ave., Cleveland 7, Ohio, to conduct operations on a world-wide basis, has been announced by James A. Bede, president of the company. Patents held by this company covering paint heaters and airless spray painting, will be made available through this organization on a licensing basis. Licensees selected so far and their respective countries are:

United States — Bede Products Corp., Amherst, Ohio.
Canada — Bede Products (Canada) Ltd., Toronto, Ontario, Canada.
British Commonwealth — T. C. Spray Finishing Systems, London, England.
France — S. A. Kremlin, Paris, France.
Italy — Fernando Bassi, Milano, Italy.

The new organization also anticipates setting up licensees in Germany, Japan, and South America.

Any improvements made in processes by licensees, under the agreement, will be available to all licensees. Bede International Development Co. will act as the nucleus for the organization, conducting tests, gathering information, and acting as supply source for licensees.

★ ★ ★

COMMERCIAL SOLVENTS CORPORATION recently furnished technical equipment for the outfitting of a Paint Technology Laboratory at the Missouri School of Mines and Metallurgy at Rolla, Missouri. Establishment of the laboratory was sponsored by the Kansas City and St. Louis sections of the Paint, Varnish and Lacquer Association.

In addition to water baths, abrasion testers, and spray guns, the gift included the original equipment used by Charles Bogin of CSC's Research Department in the development in the 1930's of the process for the application of lacquers at elevated temperatures.

★ ★ ★

OAKITE PRODUCTS, INC., manufacturer of specialized industrial cleaning and related materials, has announced the formation of an Export Division. **HARRY V. KERKER**, with Oakite since 1943, has been appointed manager of the new division.

Harry V. Kerker

Oakite manufactures specialized alkaline, solvent, and acidic detergents for the removal of all types of industrial soils from machinery and from metals in produc-

tion, as well as conveyor chain lubricants, germicides, metal drawing and burnishing compounds, the Oakite Crys-Coat phosphating process, and materials for the treatment of water in air conditioning systems and paint spray booths.

Oakite also manufactures mechanized cleaning equipment — steam guns, hot spray and foam units—for the application of Oakite cleaning materials. The company maintains extensive laboratory facilities, including a customer service laboratory, 350 Hudson St., New York, N. Y.

Booklets describing Oakite's operations in each industrial field are available from the Export Division, Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

★ ★ ★

The installation of a new, modern autoclave vulcanizing service, for the bonding of hard and soft vulcanized sheet rubber and synthetic linings to plating and industrial acid handling tanks has been announced by the **PERMA-LINE RUBBER PRODUCTS CORP.**, 1753 N. Winnebago Ave., Chicago 47, Ill. This will be an added service to existing facilities, which specialize in building and lining tanks with Koroseal, Amer-plate and other types of plastic linings, and making corrosion resistant products

Various combinations of hard, medium and soft rubber sheeting will be used to produce laminated vulcanized tank linings according to customer needs and specifications.

This new Perma-Line service will also be available for the application of hard and soft rubber and synthetic coatings and linings on pipes, fittings and other industrial acid handling products.

★ ★ ★

R. F. Huntley

Chemical Progress Week has been observed by **COWLES CHEMICAL COMPANY** at the newest and largest Cowles plant, in Skaneateles Falls, N. Y., by an open house during that period, according to R. F. Huntley, Cowles president.

The two-day event celebrated the recent opening of the new Cowles Research Laboratory and expanded warehouse and production facilities.

The new Cowles Research Laboratories represent a consolidation under one roof of several heretofore separate research, development, and sales-service laboratories. Plans for expanded and diversified production will be centered largely in this new laboratory, although Cowles will continue to operate plants in Lockport, N. Y. and Sewaren, N. J.

★ ★ ★

A special brand of "teamwork" between finishing compounds and finishing procedures is given credit by a Michigan manufacturer for achieving what is called a "new future in finishing."

"Specific compounds are teamed up with each of our finishing procedures," **ROTO-FINISH CO.**, of Kalamazoo, explained in reporting how the processes operate.

Roto-Finish compounds, a "very important part of Roto-Finish processes," are used in general to produce the necessary lubrication for the chip mass and parts being processed.

New compounds developed by Roto-Finish help prevent tarnishing, etching and rusting of parts being processed and yet maintain cleanliness in the compartment and chip mass.

In certain instances, it was explained, compounds provide abrasive necessary to produce the desired result.

Functions of compounds are many and varied, it was reported. They prevent chips from becoming glazed or loaded with fine metal particles removed from parts being deburred or finished. And grinding compounds, for example, contain water softeners to handle water hardness factors.

The Roto-Finish Britehoning process compound provides a material which causes a coating to form on chips. The resultant coating is necessary in securing proper results, as it allows the chip mass to act as a honing medium rather than a grinding or polishing mass.

In another process, the Roto-Finish Coloring procedure, compounds provide the lubrication and luster, thus producing materials necessary to produce a highly lustrous finish. A ball mass is responsible in this process for obtaining the proper lustrous finish.

The company operates a laboratory at the Kalamazoo plant where parts submitted by manufacturers are finished. The proper combination of compounds

and processes is established by the laboratory procedure to give manufacturers the method of obtaining the finishes they seek, without struggling over problems resulting from rust and insufficient abrasive action.

★ ★ ★

"Fluorocarbon plastics have now come of age," was the opinion expressed recently by Walter J. Merck of **THE M. W. KELLOGG COMPANY,** a subsidiary of Pullman, Inc., in commenting on the use being made of this group of plastics in the electronic, automotive, aircraft, protective coating and chemical fie'ds.

Mr. Merck stated that new developments in formulation, quality control, fabricating techinques, and testing of Kel-F Polymers have stimulated the use of these materials in recent years.

He mentioned that these developments have brought about dispersion coatings which can be applied to metals or nonmetals by spraying, dipping or spreading; thin films, with excellent clarity or brilliant color, which present a combination of tear and chemical resistance; glass cloth laminates, tough, strong, and resistant to abrasion and erosion; oils, waxes and greases with thermal stability up to 500 deg. F.; and high temperature, chemical-resistant rubber compounds and elastomers.

Two major types of Kel-F Dispersions are currently available: a low viscosity dispersion for spraying and a high viscosity dispersion for spread, flow and dip coating. All consist of finely divided particles of Kel-F plastic suspended in a volatile organic liquid. A few current applications for these coatings include plating coils, valves, flowmeters, reactors, tanks, vessels, shipping containers, pipe lines, pumps and agitators.

★ ★ ★

PENNSYLVANIA SALT MANUFACTURING COMPANY has moved into new offices at 3 Penn Center Plaza, Philadelphia 2, Pennsylvania.

★ ★ ★

John J. Hearne, Ireland's first ambassador to the United States, has been given a briefing on automatic spray painting by two employees of the **DeVILBISS COMPANY,** Toledo, Ohio manufacturer of spray painting equipment. The girls, both Irish lasses, are Peg Farmer and Mickey McIlhaney. The DeVilbiss customer research laboratories visited by

DeVilbiss automatic spray painting equipment is shown to John J. Hearne, Ireland's ambassador to the United States.

Mr. Hearne gave him an opportunity to see several types of automatic machines in operation spray painting various products. Mr. Hearne also toured the company's main plant.

★ ★ ★

William Whalen, vice-president and general manager of **CANADIAN HANSON & VAN WINKLE COMPANY LTD.,** has announced the purchase of the business and assets of **FREDERIC B. STEVENS OF CANADA, LTD.**

Canadian Hanson & Van Winkle Company, Ltd., supplies metal finishing equipment to Canadian industry, and has two manufacturing plants in Toronto, and an office, laboratory and warehouse in Montreal. Resident representatives are located in principal industrial centers of Canada. The acquisition of Stevens adds additional office, warehouse and manufacturing space in Windsor and additional office space in Toronto. Metal finishing sales and activities will be merged into Hanson's present organization.

In addition to exclusive representation in Canada of the Udylite Corp., Hanson & Van Winkle Co., Ltd., has assumed by this transaction sales representation of the following U. S. companies: Frederic B. Stevens, Inc., of Detroit, Mich.; MacDermid, Inc., of Waterbury, Conn.; Roto-Finish Co., of Kalamazoo, Mich.; Michigan Chrome & Chemical Co. of Detroit.

These are in addition to other agreements now in effect with Industrial Filter & Pump Mfg. Co. of Chicago, Detrex Corporation of Detroit, Acme Manufacturing Co., of Detroit, and others.

In a combined announcement, George L. Guymon, vice-president of the **INDUSTRIAL FILTRATION COMPANY**, distributors of Delpark Industrial Filters, and R. E. Mitchell, vice-president, **OLSON FILTRATION ENGINEERS, INC.**, Chicago, have announced the signing of an exclusive franchise authorizing Delpark to handle sales for the Olson Pressure type filters in the metalworking and industrial fields.

The announcement, effective immediately, makes available through Delpark representatives the Olson tubular element type filter, using diatomaceous earth.

The Olson Filter uses the precoat principle by coating screen type tubular elements with diatomaceous earth. The liquid passes through the earth into the tubular screen and is pumped back into the system.

Automatic cleaning is accomplished in 1 to 3 minutes by back washing. Filter cake and sludge are knocked from the elements and drop to a cone within the filter. An agitator prevents packing and removes the sludge. Precoating is again started and the cycle is completed.

★ ★ ★

The **STANLEY CHEMICAL CO.**, East Berlin, Conn., has named the **RUSS-HOWELL AGENCY**, with main offices at 823 28th St., S.W., Grand Rapids, Mich., to be distributor for the entire Stanley line of plastisol coatings for plating racks and tanks in the states of Michigan, Ohio, Indiana, Illinois, and Wisconsin.

The Russ-Howell firm will warehouse these materials along with a line of Stanley wash primers and custom finishes.

Heading the distribution firm are George H. Russ, who was, before the formation of the present firm, sales manager of a leading plastics manufacturer, and is an expert in the industrial coatings field, and H. John Howell, who has had many years of experience as a sales engineer in the Midwest.

★ ★ ★

The **INTERNATIONAL NICKEL COMPANY OF CANADA, LIMITED**, has made the first shipment of approximately 450,000 pounds of refined nickel to the General Services Administration of the United States Government under a contract signed between the company and the government agency last fall, providing for refining of certain nickel concentrate produced by Sherritt Gordon Mines Limited, Ralph D. Parker, general manager of Canadian Operations of International Nickel, has announced.

The contract called for delivery of a minimum of 4,500,000 pounds of refined nickel in the period ending August, 1955. As a result of improvements in the procedure for treating this concentrate, International Nickel will be able to increase deliveries materially beyond the contract minimum.

The General Services Administration, through Inco's refining of this concentrate, is thus receiving an additional quantity of nickel which would not otherwise be available. The quantity to be supplied will be in addition to International Nickel's current increased annual production rate of 275,000,000 pounds, and Sherritt Gordon's scheduled production rate of 18,000,000 pounds for 1955.

★ ★ ★

Charles Wise, secretary of **THE BUCKEYE PRODUCTS CO.**, Cincinnati, Ohio, has announced that the Baker Distributing Co., 1105 W. 11th St., Cleveland, will carry the complete line of Speedie Buffing and Polishing Compositions in the Cleveland and Toledo areas. Long known in metal finishing circles in these cities, the Baker Distributing Company is well qualified to present Speedie Buffing Compounds to all buffing and polishing plants.

★ ★ ★

The Netherlands Minister of Economic Affairs has granted **THE DOW CHEMICAL COMPANY** permission to establish a wholly-owned subsidiary company, to be known as **NEDERLANDSCHE DOW MAATSCHAPPIJ N. V.**, in Rotterdam, Netherlands, Dr. Leland I. Doan, Dow president, has announced.

The Dow application to do business in the Netherlands, as approved by the Dutch government, permits the subsidiary to import, manufacture and distribute domestically and abroad a variety of chemicals, plastics and magnesium.

The new company plans to build a manufacturing plant as well as tank storage, warehouse and dock facilities. Construction on the plant site is expected to begin about mid-1955.

Among the products the firm plans to process are® Styron, Dow's polystyrene plastic; magnesium alloys; glycols, including the products known under the trade-mark of Dowanols, and certain other chemicals now undergoing economic study.

SCHMIEG INDUSTRIES, INC., of Detroit, Mich., has received export orders for industrial ovens, spray booths and dust collectors from Spain, Brazil, Argentina, India, Mexico, South Africa, Venezuela and Canada, it has been announced by Henry M. Margolis, president.

Mr. Margolis points out in his report that Schmieg Industries, Inc., is starting an export drive abroad, and intensifying sales activities in the U. S. Among developments of Schmieg Industries, Inc., Mr. Margolis cites a package booth and dust collector unit for use in dust control of grinding operations, and the "Centri-Merge" dust collector.

★ ★ ★

Application of vitreous enamel to aluminum castings has been announced by **MONARCH ALUMINUM MFG. COMPANY**, Cleveland 2, Ohio.

"Enhanced color appeal," according to R. A. Lawson, vice president of sales, "can now add sales drama to many products. Through the use of inert pigments, light-fast colors retain their beauty, and resist stain and discoloration. A wide range of vitreous colors are now at the command of engineers when designing products to utilize the full advantages of aluminum castings."

Functionally, vitreous enamel adds much to surface protection. Having the inertness of glass, vitreous enamel provides a surface highly resistant to alkalis, acids and detergents.

Surface durability adds to the value of vitreous enameled aluminum castings when used in end products. Excellent resistance to thermal shock, salt water corrosion and abrasion has been achieved.

Monarch Aluminum Mfg. Company engineers have completed fifteen months of development in the application of vitreous enamel to aluminum castings. Experience gained by DuPont and Ferro Enamel in the processing of vitreous enameled aluminum sheets served as a background for the research.

Pilot facilities have proved successful in operation. Production facilities are now in the development stage at Monarch Aluminum's plant at 9215 Detroit Avenue, Cleveland 2, Ohio.

★ ★ ★

The integration of the several Kelite corporations operating in the United States has been completed. The stockholders of Kelite Products, Inc. of Illinois accepted a plan for exchange of shares. The combined organization is incorporated in California, as **KELITE CORPORATION**, with **L. C. SORENSEN**, founder of Kelite as president, and **W. G. NUELSEN**, former president of the Illinois corporation as senior vice president. **WILLIAM SORENSEN** is executive vice president, with headquarters in New York. There will be no change in personnel in the 98 U. S. offices maintained by the chemical and equipment firm. Kelite of Canada and Kelite of Mexico will continue to operate independently.

W. G. Nuelsen

L. C. Sorensen

★ ★ ★

ATLAS POWDER COMPANY, manufacturer of explosives, chemicals, activated carbons, and industrial finishes, will award eight $1,000 college scholarships again this year, Ralph K. Gottshall, president, has announced.

The grants will go to students who will be seniors during the 1955-56 college year, majoring in chemistry or any branch of engineering.

Consolidation of all Darco activated carbon operating into Atlas Powder Company's chemicals division has been announced by Edward J. Goett, Atlas Powder Co. vice president responsible for chemicals activities.

Previously, Darco had functioned as a separate department of Atlas, with a plant at Marshall, Texas, and sales headquarters in New York City. Early in March, the sales headquarters were transferred to the Atlas general offices in Wilmington.

All Darco sales activities now will be handled by a group in the chemicals division's sales department in Wilmington, with Dr. H. J. Fornwalt as manager.

E. W. HARRIS, formerly director of sales for the Darco department, has been appointed a special representative in con-

nection with Darco sales activities. He will continue to work out of New York City.

★ ★ ★

Rudolph Egener

The purchase of the paint spray business of **KELLOGG DIVISION OF AMERICAN BRAKE SHOE COMPANY** has been announced by Rudolph Egener, president of the **M & E MANUFACTURING CO.**, Indianapolis, Ind. The purchase involves all patents, designs, tools, equipment and material connected with the Kellogg-American paint spray line.

All Kellogg paint spray facilities are to be transformed to the M & E home office and factory in Indianapolis and all manufacturing, sales and service will be handled from the home office. M & E Manufacturing will continue to serve the large volume of automotive business held by the Kellogg Division paint spray line.

Mr. Egener, in announcing the purchase, stated that M & E Manufacturing's activity and concentration in the paint spray field and their past business association with the Kellogg Division made M & E the logical manufacturer to assume this famous line. M & E, founded in 1911, has been a producer of paint spray equipment since 1922. It is a major producer of commercial and industrial paint spray equipment, and has designed and fabricated paint spray booths and sheet metal accessory equipment for the Kellogg Division.

W. T. Kelly, president of Kellogg Division stated that he is confident that M & E Manufacturing will continue the high quality of production and service which has existed in the past.

T. L. McCorkle and C. Edward Andrews now serve as advisory on policy, supervision and direction.

★ ★ ★

THE THERMO PANEL DIVISION OF DEAN PRODUCTS, INC., 1042 Dean Street, Brooklyn, N. Y., has announced the appointments of the following sales representatives: **W. M. WILSON CO.**, 1316 Superior Ave., Cleveland, Ohio, covering the northern part of Ohio, and **A. A. BETTS CO.**, 3008 Harrison Ave., Cincinnati, Ohio, covering the southeastern part of Ohio, the eastern part of Kentucky, and the center portion of Indiana.

★ ★ ★

DOW CHEMICAL INTERNATIONAL LTD. has announced the opening of a new Far Eastern sales office in Tokyo, Japan. Occupying quarters in the Sanshin Building in that city, the new branch will service the entire Far Eastern area including Japan, Hong Kong, the Philippines, India, Taiwan, Australia and New Zealand.

H. LEE CLACK has been appointed manager and **HOWARD C. VISGER**, assistant manager of the Far Eastern branch. Mr. Clack, who has been associated with Dow for 13 years, recently served as manager of the Dow Chemical Inter-American branch office in Montevideo, Uruguay. Mr. Visger joined Dow in 1950 and was formerly Far Eastern area supervisor in the Midland export headquarters.

Continuing as Far Eastern plastics sales manager, a position which he has held since 1953, Eric C. Huggins will also be a key staff member of the new office. Before assignment to the Far East, Mr. Huggins was export manager of Dow Chemical of Canada, Limited.

★ ★ ★

MacDERMID, INCORPORATED has filed a suit against Time Chemical, Inc., in the United States District Court for the Northern District of Illinois, Eastern Division at Chicago, Illinois. In the complaint, MacDermid, Incorporated alleged, among other things, that Time Chemical, Inc., was using or employing the name "Anodex," and selling, distributing or exposing for sale a cleaning compound under this name.

After a hearing before the United States District Court, the Court entered a permanent injunction ordering Time, Chemical, Inc., to refrain from selling materials under the name "Anodex."

★ ★ ★

H. T. Sulcer, vice president and general manager of **GRAVER WATER CONDITIONING CO.** has announced the opening of a new Texas District Office at 5343 McCormick St., Houston, Texas. This Graver district office will be managed by **JAMES J. HANRATTY** and will serve all of New Mexico and Texas

except the northern Panhandle.

Mr. Hanratty has been with Graver for many years and is very well versed in all phases of industrial and municipal water treatment and industrial waste treatment. He holds both a chemical engineering and a business administration degree.

★ ★ ★

SUNSHINE SCIENTIFIC INSTRUMENT, 1810 Grant Avenue, Philadelphia 15, Pa., has announced the outright purchase of all the stock, parts, drawings, engineering, tools, jigs, fixtures and patent rights to eighteen instruments which were designed and developed by the Special Products Division of The General Electric Company.

The eighteen instruments will be manufactured, sold and serviced exclusively by Sunshine Scientific Instrument according to General Electric drawings and specifications. General Electric will no longer manufacture or service these eighteen products, and all instruments originally purchased through General Electric can now be serviced by Sunshine Scientific Instrument. Those units which are still under warranty, or any units requiring supplies, accessories or replacement parts, will be handled by Sunshine Scientific Instrument.

Instruments in this new manufacturing and selling arrangement are:

Gel Time Meter; Mercury Vapor Detector; Metals Comparator; Magnetic Comparator; Surface Resistance Indicator; Anodized Aluminum Tester; Low Mu Permeameter; Saturation Permeameter; Isthmus Electromagnet; Coil Tester; Coil Turn Counter; Electronic Tachometer; Constant Frequency Control; Time Interval Meter; Analog Field Plotter; Corona Detector; Ball Bearing Torque Tester; Stepgage.

★ ★ ★

The incorporation of **THE GENERAL ULTRASONICS CO.,** 1240 Main St., Hartford 3, Conn., to manufacture and market industrial ultrasonic processing equipment has been announced by Alexander S. Keller, Stanley R. Rich and Dr. Wilfred Roth, all of West Hartford, Connecticut. This is equipment which generates mechanical vibrations, physically similar to sound, but generally higher in frequency, covering the range from 10,000 to over a million per second. These vibrations are put into liquids and used in metal cleaning, pickling and etching.

The new corporation will handle the Rich-Roth "400" Ultrasonic Generator and associated transducers.

★ ★ ★

Coast to Coast distribution of the Barrett Sulfamate Nickel Plating Process has been announced by Richard C. Barrett, president of the **BARRETT CHEMICAL PRODUCTS CO.,** Shelton, Conn.

PROCESS ENGINEERING CO., of 4918 Jarvis Ave., Skokie, Ill, will handle general plating distribution in Illinois, Michigan, Indiana, and Wisconsin.

R. O. HULL CO., of 1300 Parson Court, Rocky River 16, Ohio, will serve Ohio, western Pennsylvania, and western New York.

ALERT SUPPLY CO., of 4755 East 49th St., Los Angeles 58, Calif., with offices in Seattle, Wash., Portland, Ore., San Francisco and Los Angeles, Calif., will become West Coast distributors.

AUSTIN F. FLETCHER, INC., Binghamton, N. Y. will cover eastern New York and northeastern Pennsylvania.

The Atlantic and New England states will continue to be served from the home office of the Barrett Chemical Products Co., in Shelton, Conn.

★ ★ ★

Announcement has been made by Clifford M. Sparks, president of **CASALBI COMPANY,** Jackson, Michigan, of the purchase of Casalbi Company of the Globe tumbling barrel from the **HUPP CORPORATION** of Cleveland, Ohio. The purchase by Casalbi Company of the equipment, patents and goodwill.

Globe tumbling barrels have been serving industry since 1902.

NEW POSITIONS

STEVE JEROME has been appointed general manager of Wagner Brothers Equipment Co., 7800 Dix Rd., Detroit 9, Mich., J. R. Wagner, president, announced.

Mr. Jerome has had widely diversified experience on the engineering, production and management levels of plant operation. Recently, Mr. Jerome was in charge of setting up a new

Steve Jerome

plant in Canada for one of the largest American manufacturers of welding equipment.

Of his new post, Mr. Jerome states, "My primary objective at the Wagner Brothers Equipment Company will be to translate the latest developments of our product design section into production-ready equipment for the Metal Finishing Industry. One of our latest projects is the standardized full automatic plater, designed for the smaller plating shop which wants fully automatic cycling of plating operations.

★ ★ ★

Heil Process Equipment Corp., Cleveland, manufacturer of chemical-proof equipment such as tanks, tank linings,

Peter L. Veit (left), Fred W. Arndt

lead anodes, heat exchangers and plastic duct systems, has announced the appointment of **FRED W. ARNDT** as chief engineer. **PETER L. VEIT** has been appointed direct sales engineer with headquarters at 152 West 42nd Street, New York.

Mr. Arndt has had wide experience in all phases of sales and engineering in the process equipment field, and was in charge of Heil's New York office prior to Mr. Veit's appointment.

Mr. Veit was associated with Grumman Aircraft Engineering Corporation as a process engineer. He is also well known throughout the plating industry. He is a member of the American Chemical Society, American Society for Metals, and is an officer of the New York branch of the American Electroplaters' Society.

James B. Day & Co. has announced the appointments of **WALTER F. ZIEL** as plant manager and **JAMES P. DWYER** as his assistant.

Walter F. Ziel

Both men have had extensive experience in all phases of the paint, varnish, and lacquer industry. Their efforts will be directed toward the development of additional and improved protective and decorative coatings for Day & Company.

★ ★ ★

R. Malcolm Koch, president, Standard Industrial Products, Inc., manufacturer of paints and industrial finishes, 1500 Park St., Evansville, Indiana, has announced the appointment of **PAUL J. KUNK** as manager of the new industrial finishes division.

The position has been newly created as part of a large expansion program in the industrial sales and research departments of the firm.

Prior to coming to Standard, Mr. Kunk was a vice president of the Moran Paint Company, Dayton, Ohio, where he had also served as manager of industrial sales.

★ ★ ★

HENRY KRAUS has been added to the engineering staff of Davies Supply & Manufacturing Co., St. Louis, it has been announced by L. A. Davies, president of the company.

Henry Kraus

Formerly, Mr. Kraus was associated with Emerson Electric, where he was a materials and methods engineer concerned with electroplating. At Davies, Mr. Kraus will concentrate chiefly on job estimating and cost analysis.

Five management changes in the marketing department of Shell Chemical Corporation have been announced by G. W. Huldrum, Jr., general sales manager.

W. C. LOWREY, district manager, St. Louis, has been named manager of the Newark district.

W. A. McCORMICK, formerly of the general sales manager's staff, has been named district manager, St. Louis.

R. W. CAMPBELL, formerly senior technical salesman for the Los Angeles district, has been named district manager, Los Angeles. He replaces J. E. Toevs, recently appointed sales manager of the company's Synthetic Rubber Sales Division.

G. E. GARLAND, district manager, New York, has been named to the sales manager's staff.

D. P. JONES, of the sales manager's staff, has been promoted to district manager, New York, N. Y.

★ ★ ★

A. White, general manager of The Barnstead Still & Sterilizer Co., has announced the appointment of **SAMUEL ATKINS** to head the New York office. Formerly, Mr. Atkins had been associated with the home office of the company in Boston, Mass. He assumed his new duties upon the opening of the New York office, which is located at 640 W. 239th St., New York 71, N. Y. Mr. Atkins has been with The Barnstead Still & Sterilizer Co. for over 12 years, and thus is thoroughly familiar with the problems associated with obtaining pure water, and with the company's demineralizers and distillation equipment.

★ ★ ★

JOHN MORDICA and **GENE C. EDWARDS,** of the Gilron Products Co. sales staff, will continue to service their respective accounts following consolidation of their organization with the Pennsylvania Salt Manufacturing Company.

As previously announced, the assets of Gilron Products have been acquired by Pennsalt Chemicals and its organization is being integrated with the parent company's Metal Processing Department. Distribution of Gilron products, which feature Drawcote, a dry, soak-type drawing compound, and includes a line of metal cleaners, will continue.

These products add diversification to Pennsalt's Foscoat and Fosbond systems.

The appointment of **JOHN BERMINGHAM,** formerly sales representative, as the western sales manager for E. F. Houghton & Co., producer of metal processing chemicals, has been announced by D. J. Richards, vice-president in charge of sales.

Mr. Bermingham succeeds the late W. A. Fletcher, who died on April 5th. The new head of West Coast sales for Houghton & Co. is chairman of the San Francisco Section of the American Foundrymen's Society and was formerly chairman of the Bay Section of the American Society for Metals.

Mr. Bermingham's headquarters will continue to be located at the Houghton West Coast Plant, located at 1500 Davidson Ave., San Francisco 24, Calif.

★ ★ ★

Joseph E. Tracey

JOSEPH E. TRACEY has been named Rocky Mountain representative for the Industrial Products Division of the Pioneer Rubber Company, makers of Stanzoil, Stanflex and Sheergrip industrial gloves.

Mr. Tracey has been active in the fields of marketing, merchandising, advertising and promotion. For ten years, immediately prior to joining Pioneer, he served as advertising manager of the Frontier Refining Co., Denver.

★ ★ ★

RALPH D. PARKER, of Copper Cliff, Ontario, has been elected vice-president, and **WALTER A. McCADDEN** comptroller, of The International Nickel Co. of Canada, Ltd., Dr. John F. Thompson, chairman of the board, has announced.

Mr. Parker continues in his post of general manager of Canadian operations. Mr. McCadden, the newly-elected comptroller, has also been elected comptroller of the The International Nickel Co., Inc.

★ ★ ★

The appointments of **ALBERT P. GAGNEBIN** as assistant manager of the

Nickel Sales Department and of **EDWARD B. BITZER** as assistant manager of the Nickel Alloys Department of The International Nickel Company, Inc., have been announced by Lars R. Larson, vice president and general sales manager of the company.

At the same time the company announced that **KEITH D. MILLIS** has been placed in charge of the Ductile Iron Section of the Development and Research Division, succeeding Mr. Gagnebin.

★ ★ ★

CHARLES B. SANBORN has joined the Electroplating Section of the Development and Research Division of The International Nickel Company, Inc., in New York, according to an announcement by O. B. J. Fraser, assistant manager of the division.

Mr. Sanborn was formerly associated with Graham Crowley & Associates, Inc., Chicago, Sherwin-Williams Co., Cleveland, and American Steel & Wire Co., Cleveland, where he was a senior research chemist at the company's research laboratories. He is a member of the American Chemical Society, the American Electroplaters' Society and the Electrochemical Society, of which he is a past chairman of the Cleveland Section.

★ ★ ★

R. W. Stephens

United Chromium Limited, Canadian affiliate of United Chromium, Incorporated, has announced the appointment of **R. W. STEPHENS** as a sales and service engineer. He will serve the Canadian metal finishing industry with the complete line of Unichrome plating processes, materials, equipment, organic coatings, and Ucilon Protective Coatings.

Mr. Stephens has long been associated with electroplating. His career started with the Appliance Division of Canadian General Electric Co. in 1935. He was with Coro of Canada Limited, Brydon Brass Manufacturing Company, and Frederic B. Stevens, Inc.

Detrex Corporation of Detroit, manufacturer of industrial metal cleaning equipment and chemicals, has announced the appointment of **BRUCE A. YOUNG** as equipment specialist for the northeastern United States. This territory covers 26 states east of the Mississippi.

Bruce A. Young

The announcement was made by A. Emmett, Jr., works manager.

Mr. Young has been associated with Detrex since 1940. Prior to his present assignment, he was regional manager for the East-Central Region.

★ ★ ★

Appointment of **GEORGE S. FORBES** as field manager for The Glidden Company's national industrial sales has been announced by A. D. Duncan, vice president and general manager of the Paint Division.

Mr. Forbes, along with Thomas N. Armel, general manager of Industrial Sales, will supervise all phases of Glidden's industrial coating business, industrial maintenance sales, and transportation business, including railway, aircraft, and marine finishes.

★ ★ ★

Gordon J. Berry, president, The Electric Products Co., Cleveland, has announced the appointment of **G. J. DOSS** as manager of marketing. He will be responsible for the coordination of sales and promotion of all divisions of the company.

Mr. Doss came to The Electric Products Co. in 1946 as manager of the Cleveland District Office and in 1951 was advanced to assistant sales manager. In 1953, he was appointed general manager of the Switchboard and Control Division.

★ ★ ★

Election of **VINCENT P. REINFELD** as president of Pyrosil, Inc., Cuyahoga Falls, Ohio, manufacturer of industrial electroplating, infra-red oven and acid pickling accessories has been announced.

Elmer A. Lord

C. C. Bassett, vice president and director of sales of Cowles Chemical Co., Cleveland, Ohio, has announced the appointment of **ELMER A. LORD** as sales representative for Cowles metal cleaners in Northern Ohio, Western Pennsylvania and West Virginia.

Mr. Lord has been connected with Cowles for seven years in production control and as advertising and sales promotion manager. Most recently he represented Cowles' heavy chemicals department in the same area.

★ ★ ★

RICHARD A. MIXER, corrosion engineer in the MW Protective Coatings Division of Metalweld, Inc., has been advanced to the position of manager of that division.

Before coming to Metalweld, Mr. Mixer was associated with the plastics division of a large Philadelphia chemical firm.

★ ★ ★

J. F. Koval, vice-president of Willow Rubber and Lining Co., Belleville, Mich., recently announced the addition of **EDWARD H. HINDLE** to the executive board and sales staff.

Mr. Hindle joined the U. S. Rubber Company in 1937 and served with that firm in development, product engineering, and sales engineering until his new association with Willow Run Rubber.

Active in engineering and technical groups, he is a member and has been chairman of the Detroit Rubber and Plastic Group. At present, he is a counselor and a member of this group's executive committee. He is a member of the Society of Automotive Engineers and the Engineering Society of Detroit.

Willow Run Rubber and Lining Company produces molded rubber parts in all sizes and shapes from natural and synthetic compounds. In addition, this company engineers, fabricates, and installs rubber lined, coated, and covered tanks, pressure vessels, duct and exhaust systems, pipe and fittings.

Appointment of **ROBERT B. WILLIAMS** as assistant manager of the Pittsbugh Plate Glass Company, Kansas City, Mo., distributing branch, has been announced by D. C. Burnham, vice president of the merchandising division. He succeeds **E. F. FARRELL** who has been named manager of the Syracuse, N. Y., distributing branch.

WAYNE J. ADRIAN has been appointed to succeed Mr. Williams as manager of the Colorado Springs, Colo., service branch. Also, **JAMES B. SPRAGUE, JR.,** formerly credit manager of the Houston, Texas, distributing branch, has been named manager to succeed Mr. Adrian at the Galveston, Texas, service branch.

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DONALD A. IRWIN has joined the staff of the Pittsburgh Plate Glass Company Research Center at Springdale, Pa., as a chemist in organic research. A graduate of Duquesne University, he received a Bachelor of Science degree in chemistry in 1952 and a Masters degree from the same school in January.

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Appointments of **GEORGE B. ANDERSEN** and **GEORGE W. WILLIAMS** as regional sales supervisors for the Distributor Division of Pittsburgh Plate Glass Company's Ditzler Color Division in Detroit, Michigan, has been announced by Neil A. Fleming, Ditzler sales manager.

★ ★ ★

James H. Munger

T. G. Meulenberg and Robert Redmond, president and vice-president, respectively, of Automotive Rubber Co., Inc., Detroit, have announced that **JAMES H. MUNGER** has been added to the sales engineering staff.

Formerly, Mr. Munger was associated with the Victor Manufacturing and Gasket Co., Chicago, Ill. He had also served with the Roller Bearing Co. of America, West Trenton, N. J., in a sales-engineering capacity.

Mr. Munger's activities will be concerned with a broad line of rubber insulated metal parts, molded rubber goods, rubber parts, and rubber extrusions.

H. D. McLEESE has been appointed general sales manager of Metal & Thermit Corp., producer of metals, industrial chemicals, welding equipment and supplies. Mr. McLeese, previously vice president and general sales manager of United Chromium, Inc., a Metal & Thermit subsidiary, will direct the sales of all Metal & Thermit and United Chromium products, making his headquarters in the company's executive offices in New York.

A chemical engineer, Mr. McLeese at one time did research work on chromium plating under Dr. Colin G. Fink at Columbia University. Prior to that he had been connected with Bell Laboratories and Dow Chemical Co. as a chemist.

His experience in plating led to later affiliations, in sales capacities, with the Chemical Treatment Co., and with Chromium Corporation of America and United Chromium Incorporated, both subsidiaries of Metal & Thermit.

DR. J. E. STARECK has been appointed Director of Research of Metal & Thermit Corp., New York, N. Y., producer of metals, industrial chemicals, welding equipment and supplies, H. E. Martin, president, has announced. Dr. Stareck will also continue to direct the research activities of United Chromium.

Dr. Stareck joined the research staff of United Chromium, Inc., in 1935 and for a number of years was associated with the Waterbury, Conn. laboratories. In 1941 he moved to the Detroit research laboratories of United Chromium as director of research,

Dr. Stareck is an active member of the American Electroplater's Society, the American Society for Testing Materials, the American Chemical Society, the Electrochemical Society, the Institute of Metal Finishing, and the Engineering Society of Detroit, Michigan.

Dr. J. E. Stareck

H. D. McLeese

The U. S. Hoffman Machinery Corp., New York, N. Y. has announced the appointment of **EDWARD H. ELLIOTT** as representative for the Hygrade Metal Finishing Division in Philadelphia.

Mr. Elliott will serve eastern Pennsylvania, Delaware, and southern New Jersey, according to Revis L. Stephenson, vice president.

The Hygrade Metal Finishing Division produces mechanized metal cleaning and phosphatizing systems and filters, paint booths and bake ovens, chemical plating equipment, electrostatic spray painting apparatus, pressure vessels and weldments for the process industry.

★ ★ ★

E. V. DOWDEN, manager of Osborn Manufacturing Company's Brush Division, has been named a vice president of the company. Announcement of the promotion was made by Osborn President Norman F. Smith.

EVERETT A. SISSON has been elevated to sales manager of the Brush Division of Osborn Manufacturing Co.

This move became effective March 1, 1955, when, at the same time, **H. L. BURTON, JR.,** was promoted to assistant sales manager, Brush Division.

★ ★ ★

GEORGE B. BEITZEL, president of the Pennsylvania Salt Manufacturing Co. has expressed to the board of directors his desire to retire as chief executive later this year, when he completes twenty-five years' service with the company. At the same time, he recommended that **WILLIAM P. DRAKE** be appointed executive vice president, and elected to board membership. Both recommendations were approved.

★ ★ ★

HUGH C. LAND will succeed William P. Drake as head of the Pennsylvania Salt Manufacturing Company's Industrial Chemicals Division, it has been announced. Mr. Drake recently was named executive vice president when president George B. Beitzel announced plans to retire later this year upon completion of 25 years' service with the company.

As general manager of this division, Mr. Land will direct both production and sales activities. These include four plants and ten sales offices which produce and distribute a diversified line of heavy chemicals.

Dr. Wouter Bosch

The first phase of a major corrosion research program, under the sponsorship of the **FEDERATION OF PAINT AND VARNISH PRODUCTION CLUBS** has been assigned to North Dakota Agricultural College at Fargo, North Dakota. **DR. WOUTER BOSCH**, head of the Paint Technology Laboratory at NDAC, has been selected as coordinator of this project, which will seek to determine the minimum paint film thickness for economical protection of hot rolled steel against corrosion.

Dr. Bosch is well known to the decorative and protective coatings industry. In addition to being head of the Paint Technology Laboratory, he has, for a number of years, given Summer Short Courses for beginners and advanced students in paint technology at NDAC, and has appeared on many Federation programs.

It is particularly appropriate that this assignment occurs in 1955, the 50th anniversary of the founding of the Paint Technology Course at North Dakota Agricultural College.

The Federation Corrosion Committee membership for 1954-55 is as follows: Dr. Tomecko (Montreal Club); Dr. Bosch; H. L. Crawford (Houston Club); T. A. Dembski (New England Club); M. P. Feely (Toronto Club); C. M. Jackson (Louisville Club); C. G. Moore (Chicago Club); G. G. Schurr (Chicago Club); J. Skala (Northwestern Club); and G. H. Wescott (Philadelphia Club).

meetings OF INTEREST TO FINISHERS

July 23. Annual Stag Day, Detroit Branch, A.E.S., Glen Oaks Country Club, Detroit, Mich.

Sept. 14-16. Annual Shop Practice Forum, Porcelain Enamel Institute, Ohio State University, Columbus, Ohio.

Oct. 9-13. Fall Meeting, The Electrochemical Society, William Penn Hotel, Pittsburgh, Pa.

Opportunity Section

REPRESENTATIVES

Distributors, jobbers and manufacturers' agents wanted by a leading midwestern manufacturer to distribute and sell a complete line of polishing and buffing compounds in bar, spray or paste form. Several territories now open. Please give all particulars in first letter which will be held in strict confidence.

McALEER MANUFACTURING CORP.
101 S. Waterman Avenue • Detroit 17, Mich.

FOR SALE

Flat Polisher

1 Used Hill Acme Grinding & Polishing Machine. 36" Capacity. Pinch Roll Feed. Very Good Condition. Located in Michigan. Priced to Sell!

Al Larrabee—P. O. Box 69—Huntington Park, Calif.

SALES REPRESENTATIVE

Wanted — a salesman thoroughly acquainted with plating industry, to sell Copper Core Chrome Plating Anodes. Excellent opportunity with one of country's leading manufacturers. Additional non-conflicting lines may be carried. Liberal compensation plan. Reply to The Gilbert Tramer Co., 1217 Main Ave., Cleveland 13, Ohio.

COMPLETE PLANT WANTED — Nickel and Chrome Plating — 48" x 36" x 36" tanks (approx.) Box No. 73, c/o PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio.

Opportunity Section

SOUTH FLORIDA TEST SERVICE

Testing—Inspection—Research—Engineers

Consultants and specialists in corrosion, weathering and sunlight testing.

4201 N.W. 7th St. • Miami 34, Florida

INDUSTRIAL SALES ENGINEERS

Situation open—previous or current sales experience in vapor degreasing equipment, alkali washers, dryers, trichlorethylene and perchlorethylene required.

CIRCO EQUIPMENT COMPANY

Clark Township • Rahway, N. J.

PROCESS ENGINEER

Precision Barrel Finishing Equipment

Live in Southern California—the land of progress and opportunity. Position open with Los Angeles manufacturer making the world's most complete and advanced line of barrel finishing equipment. Opening in barrel finishing processing and development department. Advancement opportunities for sharp, aggressive young man. Degree NOT necessary but at least 4 years experience in barrel finishing procedures, media, compounds, etc. is required. Give full business and personal background—salary desired, first letter. Write Box No. 71, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

Brand New Detrex Washers

ATTRACTIVELY PRICED

Single Stage Steam Heated Wire Mesh Belt Washer

Work opening 36" wide x 18" high. Approx. overall dimensions 10' L x 6'9" W x 6' H. FOB Pittsburgh, Pa.

Single Stage Steam Heated Gravity Roll Washer

— complete with exhaust system. Work opening 16" wide x 14" high. Approx. overall dimensions 9' L x 4' W x 7' H. FOB Detroit, Mich.

Single Stage Steam Heated Monorail Washer

Work opening 30" wide x 24" high. Approx. overall dimensions 10' L x 6'6" W x 6'6" H. FOB Detroit, Mich.

DETREX CORPORATION

Box 501 • Detroit 32, Michigan

How Thick are Your Coatings?

Measure film thickness with the Elcometer. Write for leaflet and prices.

GARDNER LABORATORY, INC.

DEPT. PF • BETHESDA 14, MD.

TECHNICAL SALES ENGINEER

Precision Barrel Finishing Equipment

Live in Southern California—the land of progress and opportunity . . . L. A. territory open for man capable of earning $10,000 to $15,000 year on Salary-plus basis. Wonderful opportunity with manufacturer of the most complete and advanced line of barrel finishing equipment. At least 3 years of sales and engineering experience on barrel finishing and procedures is required. Give full business and personal background, salary desired in first letter. Write Box No. 72, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

REPRESENTATIVE

SITUATION OPEN — Representative wanted to handle complete line of tumbling barrels, equipment, abrasives, compounds, etc., direct to metal working plants. Liberal commissions and repeat sale items. Territories open are Pittsburgh, Detroit, Chicago, Milwaukee, and Indianapolis. Write, giving lines presently handled.

TUMBLING SALES & SERVICE CO.

King St. Greenwich, Conn.

Unusual Sales Opportunities

Leading manufacturer of infra-red baking and drying units and ovens offers a splendid opportunity to several successful manufacturers' representatives and salesmen now selling allied lines of equipment directly to users. Several excellent territories now open with almost unlimited earning possibilities on a liberal commission plan, selling by proven Demonstration method. Write (do not phone) giving complete information on experience, lines now handled and territory covered. Information given will be treated confidentially. DRIQUIK Div. Dry Clime Lamp Corp., Greensburg, Indiana.

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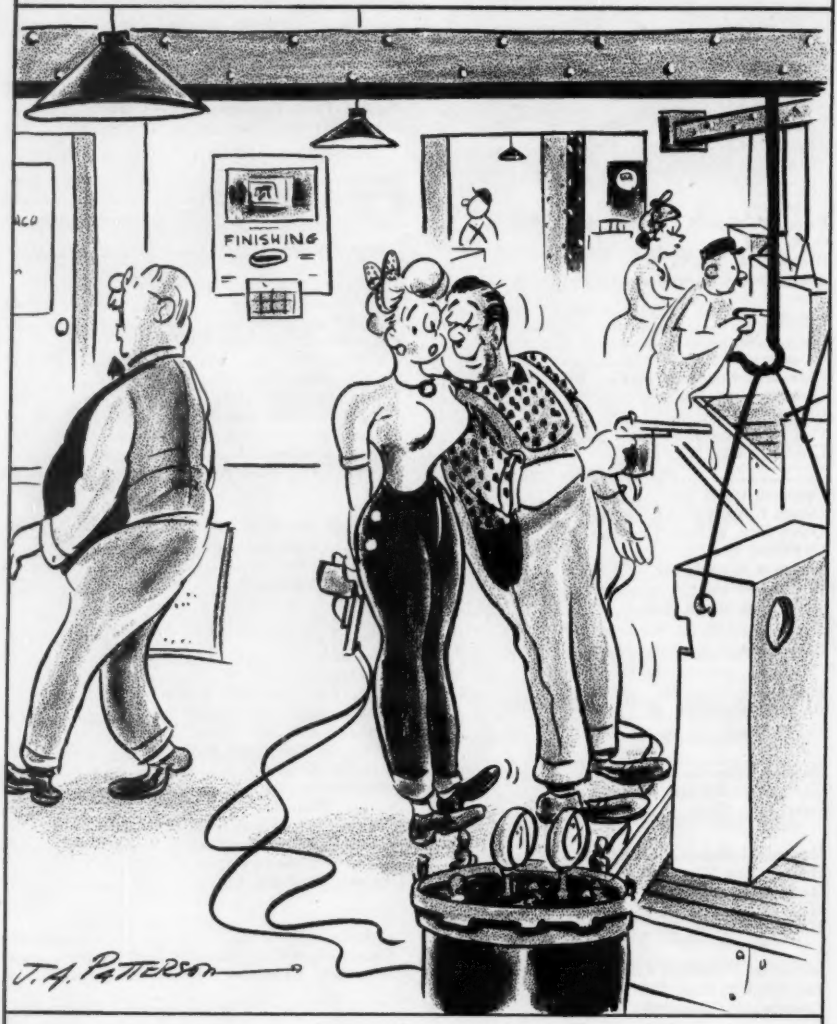
The Finishing Touch — **By J. A. Patterson**



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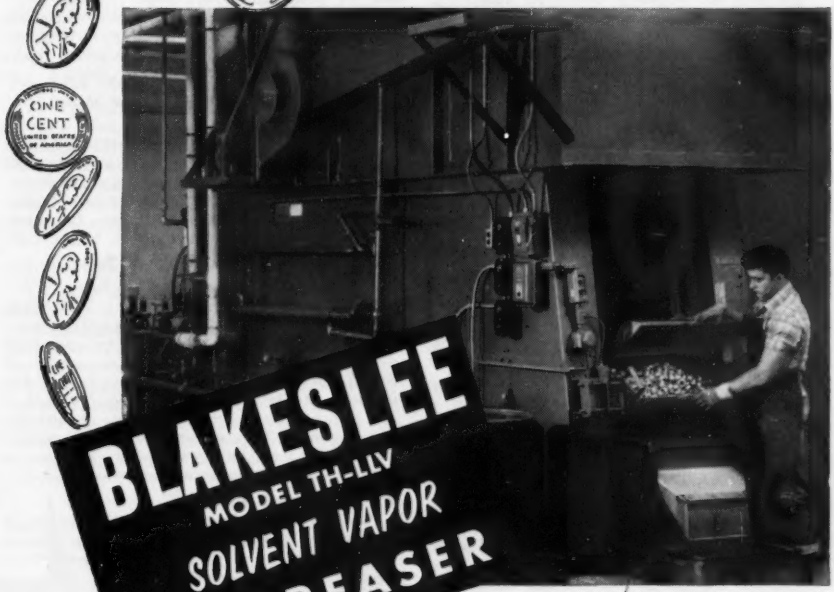

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PRODUCT LITERATURE

59. Trench Engineering Data

Pennsylvania Salt Manufacturing Co., Philadelphia 7, Pa., offers Construction Plan No. 608, an aid to engineers in building trenches for carrying corrosive liquids. Calculations are aided by this method of determining size, slope, and design of trenches.

60. Tumbling Abrasives

Details on various types of tumbling abrasives are contained in a catalog available from The Exolon Co., 943 East Niagara St., Tonawanda, N. Y.

61. Infra-red Ovens

A variety of applications for infra-red ovens are shown in a booklet available from the Fostoria Pressed Steel Corp., Dept. 622, Fostoria, Ohio.

62. Airless Spray Painting

Full information on airless spray painting is given in a catalog which may be obtained from the Bede Products Corp., Jackson St., Amherst, Ohio.

63. Generators

Generators are the subject of Bulletins D-101 and D-102, which may be obtained from Chandeysson Electric Co., 4082 Bingham Ave., St. Louis 16, Missouri.

64. Electrocleaner

Features of Lectrite NF, an electrocleaner for non-ferrous metals, are described in literature available from Wyandotte Chemicals Corp., Dept. 2300, Wyandotte, Mich.

65. Molybdenum Properties

A flow chart showing how molybdenum is manufactured and controlled from oxide to finished product is featured in a brochure issued by Sylvania Electric Products, Inc., 1740 Broadway, New York 19, N. Y. The booklet, "Sylvania Molybdenum," NP-428, provides information on molybdenum properties, processing, and product use.

66. Preparation, Plating and Protection Products

Products and processes for metal preparation and plating are discussed in a folder being distributed by the Promat Division, Poor & Co., 851 S. Market St., Waukegan, Ill. Plating products include Probrite White Alloy, and Superimposition Kicker Units.

67. Heat Exchangers

Information on advantageous features of Thermo-Panels, designed for heating or cooling solutions for electroplating, phosphatizing, degreasing and metal washing is given in a bulletin being distributed by the Thermo-Panel Division, Dean Products, Inc., 616 Franklin Ave., Brooklyn 38, N. Y.

68. Circular Chrome Plater

Advantages in the use of the Lasalco Circular Chrome Plater are shown in literature available from Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

69. Blackening Processes and Metal Cleaners

A comprehensive study of the application of black oxide finishes is contained in a booklet available from the Mitchell-Bradford Chemical Co., Wampus Lane, Milford, Conn. The study covers blackening processes, metal cleaners, rustproofing oils and plating specialties.

70. Strippable Plastic Coating Data

Release No. 101 available from Chem Products Corp., 96 Silas Deane Highway, Rocky Hill, Conn., gives technical data on performance tests and properties of Speel-100, a strippable plastic coating for metals. Resistance to abrasion, weather conditions, temperature, and chemicals are among the performance tests described. Solids content, viscosity, and color retention are properties mentioned.

71. Backstand Idlers

Features of Belt Master Backstand Idlers are explained in literature which may be obtained from the Matheu Tool Works, 2426A North Clybourn, Chicago 14, Illinois.

72. Portable Plating Barrel

Literature on a new portable plating barrel is available from the George A. Stutz Mfg. Co., 4410 Carroll Ave., Chicago 24, Illinois.

73. Buffs

Buffs are the subject of a catalog which may be obtained from the Schaffner Manufacturing Co., Inc., Emsworth, Pittsburgh 2, Pa. These buffs are designed to run cooler and consume less compound.

USE CARD FOR FREE LITERATURE

74. Water Wash Spray Booths

Advantages and engineering features of Despatch water wash paint spray booths are explained in Bulletin No. 66, available from the Despatch Oven Co., 4554 N. Broadway, Chicago, Ill.

75. Industrial Batch Ovens

Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md., has available Bulletin 5510, describing the Blue M line of industrial batch ovens with Power-O-Matic Control. Complete details are given for this control, which automatically proportions minimum wattage to operating temperature and work load.

76. Tack Cloth

A free sample of the Klix "Tack Rag" is available from Grenco Mfg. Co., 47 McClellan Terrace, West Orange, N. J. These cleaning cloths are impregnated with materials which make dust and other particles cling to them, and thus assist in cleaning surfaces to be finished.

77. Grinding and Polishing Equipment

Catalog No. 60 is a complete index to finishing equipment supplied by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo 54, Mich. Information and specifications are given for polishing and buffing lathes, dust collectors, backstand idlers, abrasive belt grinders, rotary and straight line automatic finishing machines, and other equipment for the finishing industry.

78. Testing Instruments

Sunshine Scientific Instrument, 1810 Grant Ave., Philadelphia, Pa., has announced the availability of Catalog No. 101, listing a variety of instruments for which this company has recently purchased manufacturing and selling rights.

Newly designed and developed by the Special Products Division of the General Electric Co., these 18 instruments have a wide variety of applications in many specific fields.

79. Full Flow Solution Filters

Houdaille-Hershey of Indiana, Inc., Filtration Division, 216 Superior Ave., Lebanon, Ind., has available Equipment Bulletin 101 covering a complete line of Honan-Crane full flow filters. Illustrations, specifications and full information on various models are given.

80. World's Largest Plating Plant

The story of the world's largest plating plant is presented in a folder which may be obtained from the George L. Nankervis Co., 19255 W. Davison, Detroit 23, Mich. Photographs and a plan view of the layout are shown to help describe this bumper plating plant.

81. Phosphate Coatings

Process details for using Houghto-Phos Zinc Phosphate Surface Conditioners for Ferrous Metals are given in a pamphlet available from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pennsylvania.

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82. Oxidizing Agents

Details on Oxy-Dyz-Ene oxidizing agents, for use in giving copper and brass a black finish may be obtained from Krembs & Co., 639 W. Ohio St., Chicago 10, Ill.

83. Industrial Ovens

Information on ovens designed for specific production requirements is given in a bulletin which may be obtained from the Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

84. Air Sander

Sundstrand Machine Tool Co., Pneumatic Div., Rockford, Ill., is distributing a leaflet showing desirable features of the Sundstrand Orbital Air Sander. Specifications are given, and operational details included. Also available is a sanding guide, which shows the proper pad and abrasive, and the lubricant to use for each type of sanding operation. The latter is in slide rule form, the information appearing in a slot when the rule is set for a certain operation.

85. Spray Masks

A brochure entitled "Spray Masks" has been issued by Wm. M. Fiore, Inc., 135 Liberty St., New York 6, N. Y. This literature defines and illustrates the major types of masks for spray-decorating plastics, die-castings and metal stampings.

86. Wire Conveyor Belts

The Cambridge Wire Cloth Co., Cambridge, Md., offers a bulletin which discusses woven wire conveyor belts for metalworking plants.

87. Industrial Washing Machines

The International Conveyor & Washer Corp., Detroit, Mich., has available a bulletin covering the Hydro-Flow industrial washing machine. A full description, together with illustrations and specifications of this and other washing machines are presented.

88. One Coat Hammer Finish

Details on Barcoloid One Coat Hammer Finish are given in a pamphlet which may be obtained from the Barrett Varnish Co., 1532 S. 50th Court, Cicero 50, Ill. Specifications on baking schedules, hardness, gloss, and air dry schedules are included.

89. Phosphate Coatings

The Neilson Chemical Co., 6561 Benson St., Detroit 7, Mich., offers bulletins describing Lyfanite processes, which are corrosion resistant phosphate coatings for aluminum, ferrous, and other metal surfaces. Lyfanite coatings are said to provide excellent paint bonding properties and resistance to corrosion.

90. Vinyl Protective Coating

Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif., has available a bulletin describing Amercoat No. 87, a vinyl protective coating. This coating allows application of a heavy vinyl mastic in one operation, after priming.

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